

8805 7326

TW
859
C64
C3755
no. 3
U-6

U. S. DEPARTMENT OF THE INTERIOR
PROTOTYPE OIL SHALE LEASING PROGRAM

TRACT C-b

QUARTERLY REPORT #3

(Through May 31, 1975)

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Submitted to:

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Area Oil Shale Supervisor
Conservation District
U. S. Geological Survey
Grand Junction, Colorado

By:

Ashland Oil, Inc.
Atlantic Richfield Company
Shell Oil Company, Operator
The Oil Shale Corporation

JULY 15, 1975

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II B-11 GEOPHYSICAL LOG DATA

The geophysical logs submitted in Quarterly Report #3 essentially complete the package of logs on the vertical holes drilled to date. Logs from the inclined hole drilling are not yet available, and it is possible that some future vertical drilling in preparation for the sinking of mine shafts may produce additional geophysical logs. As discussed in previous quarterly reports, our logging program includes several types of logs not specifically required by the Lessor. Specifically the cement bond log, perforation information logs and collar log, provide information related to well completion. The purpose and description of the other types of logs used can be found in previous quarterly reports.

The following table summarizes the logs presented herein.

TABLE II B-58
GEOPHYSICAL LOGS
IN
QUARTERLY REPORT 3

| | AT-1B | AT-1C | AT-1D | CB-1 | CB-2 | CB-4 | SG-1 | SG-1A | SG-6 | SG-9 | SG-11 | SG-17 |
|------------------------------------|-------|-------|-------|------|------|------|------|-------|------|------|-------|-------|
| Cement Bond Log | X | X | X | X | X | X | X | | | X | X | X |
| Perf Record & Collar log | X | X | X | X | | X | X | | X | | X | X |
| Perf Depth log | | | | X | | | X | | | X | | X |
| Open Hole Amplitude & Volume | | | | | | | | X | | | | |
| Borehole Comp. Sonic | | X | | | | | | X | X | | | |
| Laterolog | | X | | | | | | X | X | | | |
| Neutron Formation Density | | X | | | | | | X | X | | | |
| Temperature | | X | | | | | | X | X | | | |

Schlumberger

CEMENT BOND LOG

GR-VDL-CCL

COUNTY RIO BLANCO

Field or

LOCATION

WELL AT-1B

COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL AT-1B

FIELD

COUNTY RIO BLANCO STATE COLORADO

LOCATION

API Serial No.

Sec. 7 Twp. 3S Rge. 96W

Other Services:

ORP-HD
BP-B

Permanent Datum: GROUND LEVEL, Elev. 6909
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling, Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6909

| | | | |
|-------------------|-------------|------------------|-----------------|
| Date | 9-12-74 | Type Drill Fluid | WATER |
| Run No. | ONE | Fluid Level | 235 |
| Depth — Driller | 1632 & 1456 | Max. Rec. Temp. | 90 °F |
| Depth — Logger | 1631 & 1464 | Est. Cement Top | 1222 |
| Btm. Log Interval | 1623 & 1456 | Equip. Location | 3862 VERNAL |
| Top Log Interval | 1100 & 1100 | Recorded By | MARTIN/ST.AUBYN |
| Open Hole Size | 7 7/8" | Witnessed By | MR. RDSS |

| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom |
|------------------|------|-------|-------|------------|-----|--------|
| Surface String | 5/8 | - | | T & C | 0 | 60 |
| Prot. String (1) | 3/8 | 4.7 | | T & C | 0 | 1632 |
| Prod. String (2) | 3/8 | 4.7 | | T & C | 0 | 1456 |
| Grading (3) | 3/8 | 4.7 | | T & C | 0 | 1217 |

PRIMARY CEMENTING DATA

| STRING | Surface | Protection | Production | Liner |
|--------------------|---------|------------|------------|-------|
| Vol. of cement | | | 220 SLS | |
| Type of cement | | | CLASS "C" | |
| Additive | | | .6 GLL | |
| Retarder | | | | |
| Wt. of slurry | | | | |
| Water loss | | | | |
| Type fluid in csg. | | | | |
| Fluid wt. | | | | |

FOLD HERE

The well name, location and borehole reference data were furnished by the Company

PRIMARY CEMENTING PROCEDURE

| | Hour - date | Hours from start of operation | REMARKS |
|------------------------|---------------|-------------------------------|-----------------------------------|
| Started pumping cement | 13:00 7-22-74 | | Service Order No. 1231 |
| Release pressure | 15:00 9-12-74 | | Csg. Collars Recorded 19 ft. DEEP |
| Start Cement Bond Log | 17:00 9-12-74 | | |
| Finish Cement Bond Log | | | |

| | | |
|-----------------|--------------|---|
| Preceding fluid | Volume bbls. | Pipe reciprocated during Pumping: Yes No |
| Cement pumped | bbls./minute | Pipe reciprocated after plug down: Yes min., No |

SQUEEZE JOB DETAIL

| | 1 | 2 | EQUIPMENT DATA | Centralizer Depths | Scratcher Depths |
|------------------------|---|---|-----------------------|--------------------|------------------|
| Squeeze number | | | Sonic Panel No. | | |
| Date | | | Sonic Cart No. | | |
| Depth interval | | | Sonic Sonde No. | | |
| Type cement | | | CRP No. | | |
| Volume of cement | | | Mem Panel No. | | |
| Additive | | | GR Panel No. | | |
| Retarder | | | GR Cart No. | | |
| Weight of slurry | | | Centralizer: Type No. | | |
| Preceding fluid | | | To Level (MV) | | |
| | | | Cart. Gain | | |
| | | | CRP Intensity | | |
| | | | R9G Intensity | | |
| Breakdown pressure | | | | | |
| Max. pressure-stage 1 | | | | | |
| " " 2 | | | | | |
| " " 3 | | | | | |
| Final maximum pressure | | | | | |
| | | | Logging Speed | | |
| | | | Time Constant | | |
| Started pumping cement | | | | | |
| Released pressure | | | | | |
| Start CBL | | | | | |
| Finish CBL | | | | | |

AVERAGE WELL DRIFT:

from to ; from to ; from to

TRANSIT TIME

CASING BOND

VARIABLE DENSITY

TRANSIT TIME

MICROSECONDS _____ SPACING _____
400 _____ 200 _____

GAMMA RAY API UNITS

DEPTH

CASING BOND MILLIVOLTS

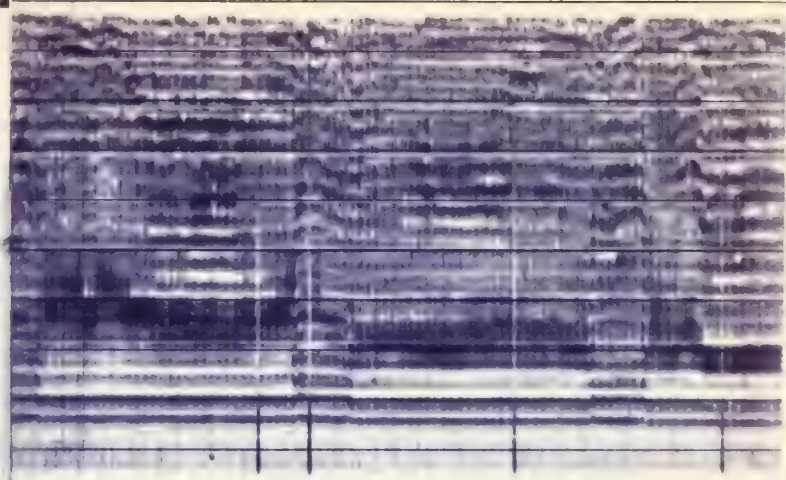
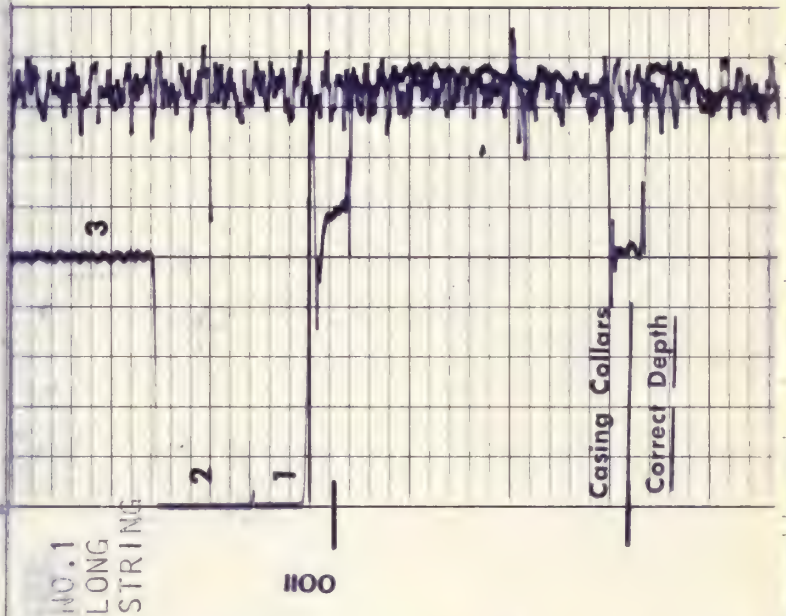
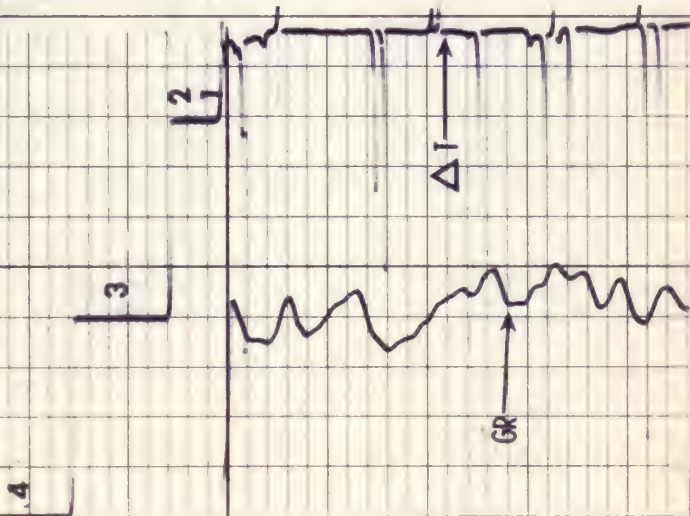
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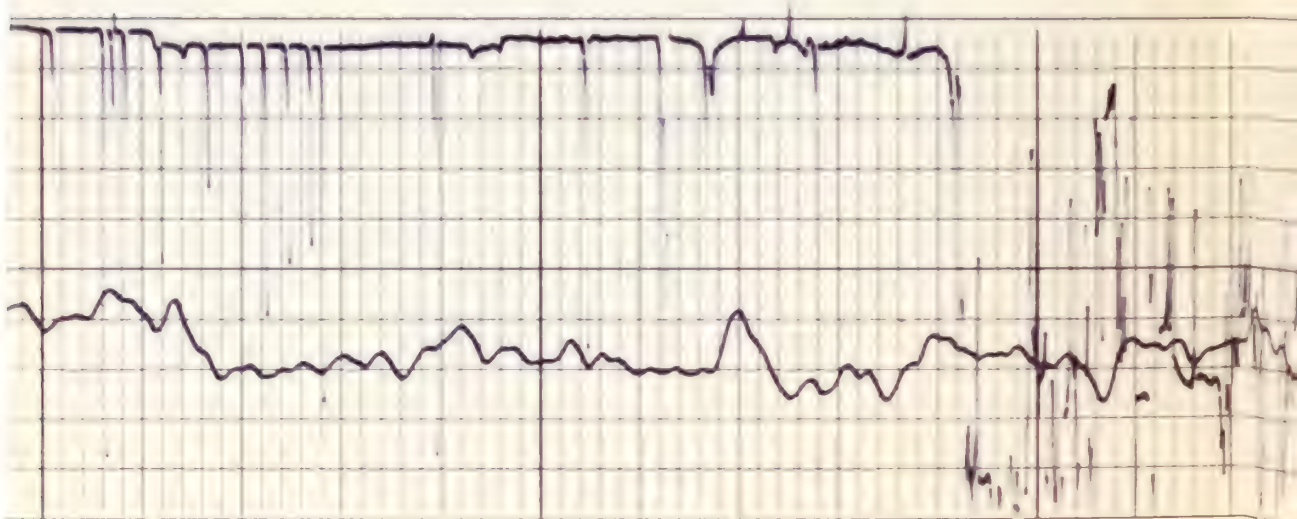
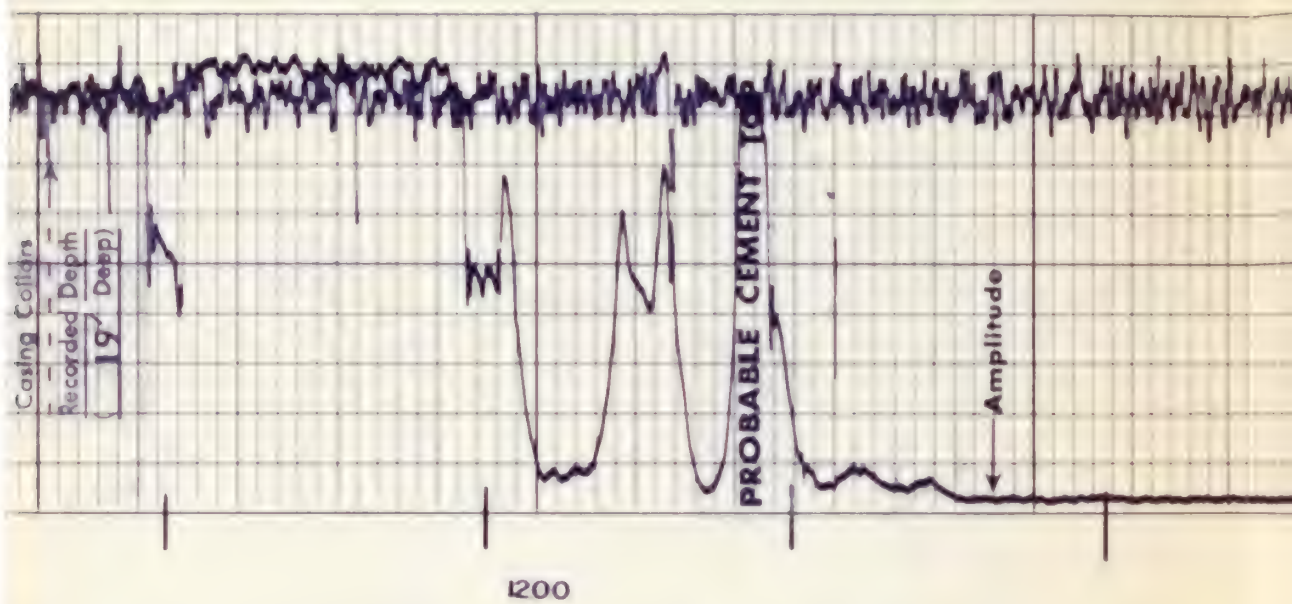
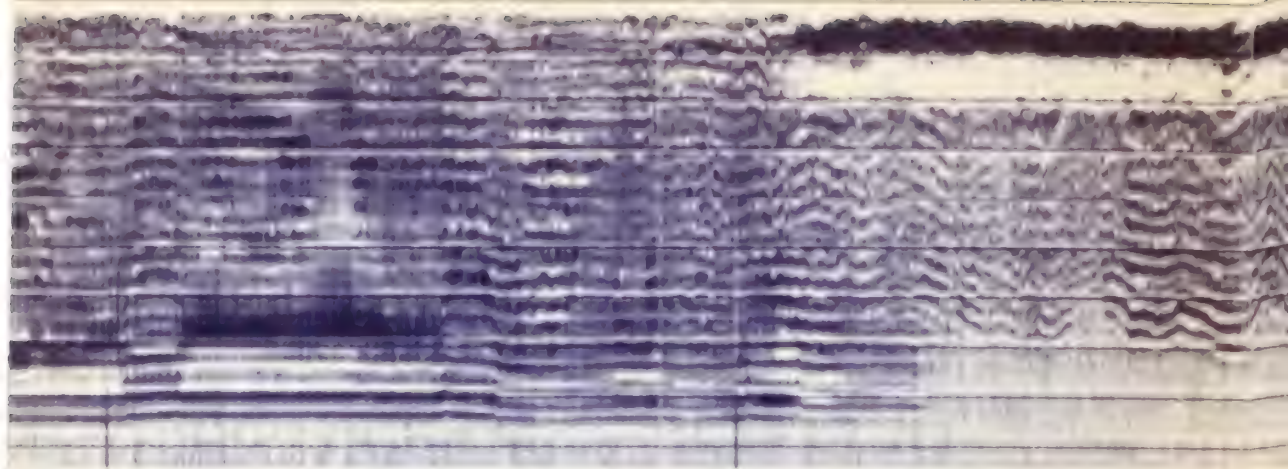
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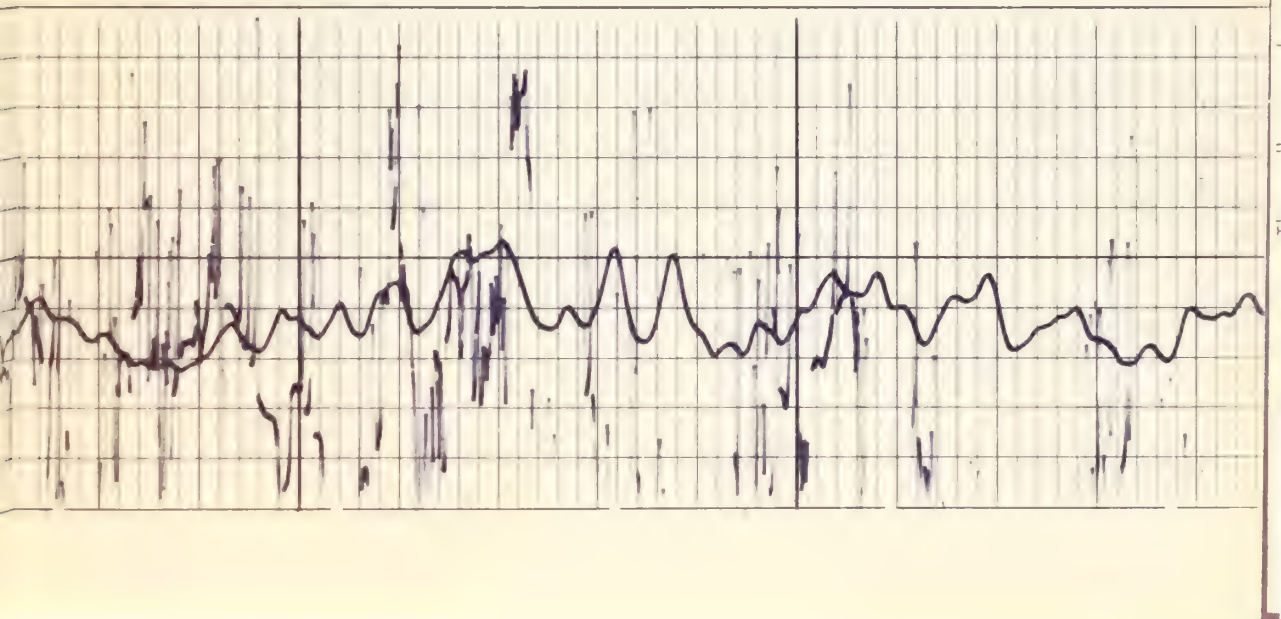
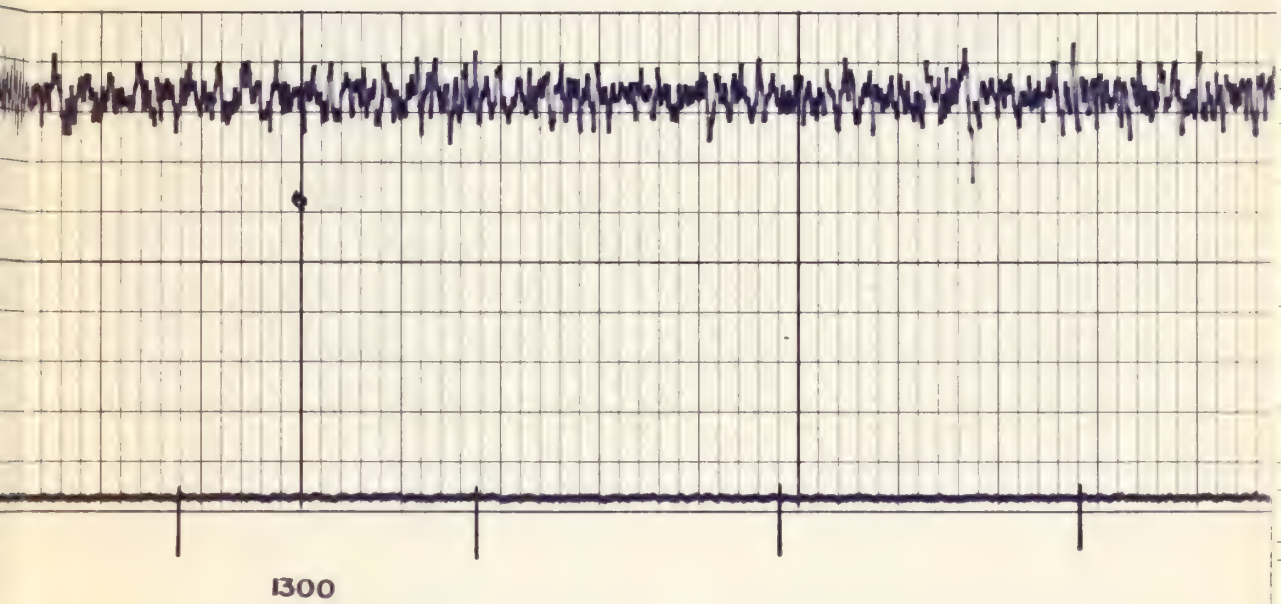
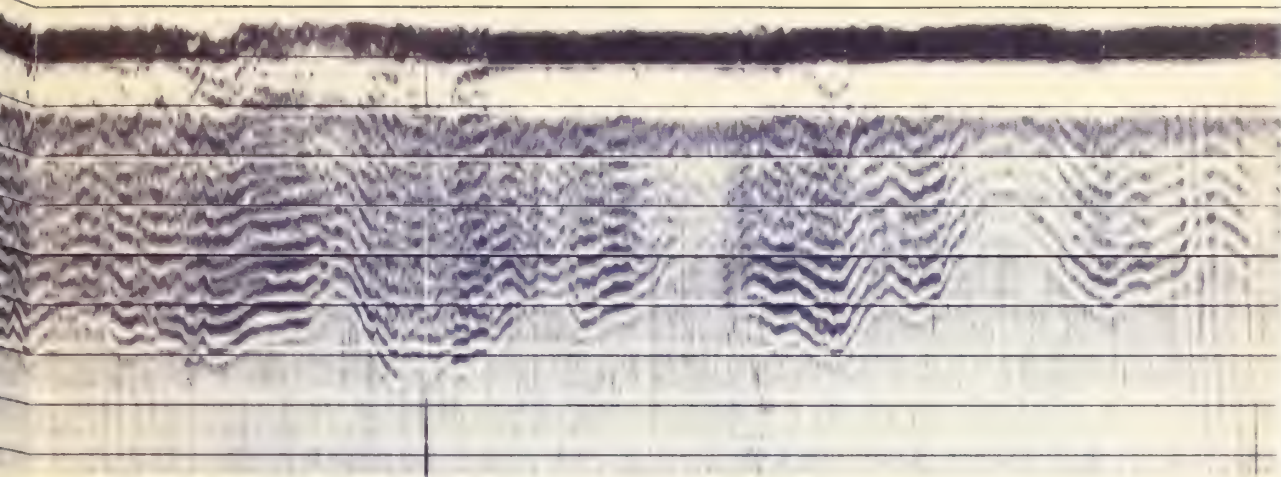
MICROSECONDS _____ SPACING _____
200 _____ 1200 _____

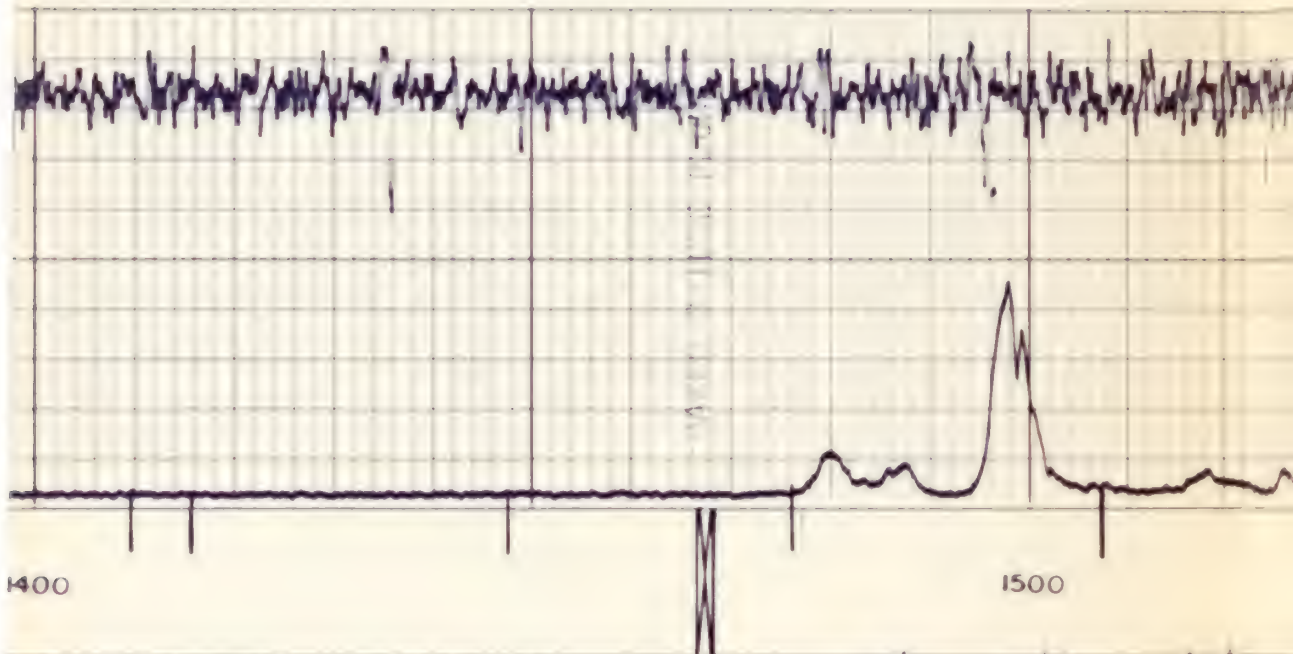
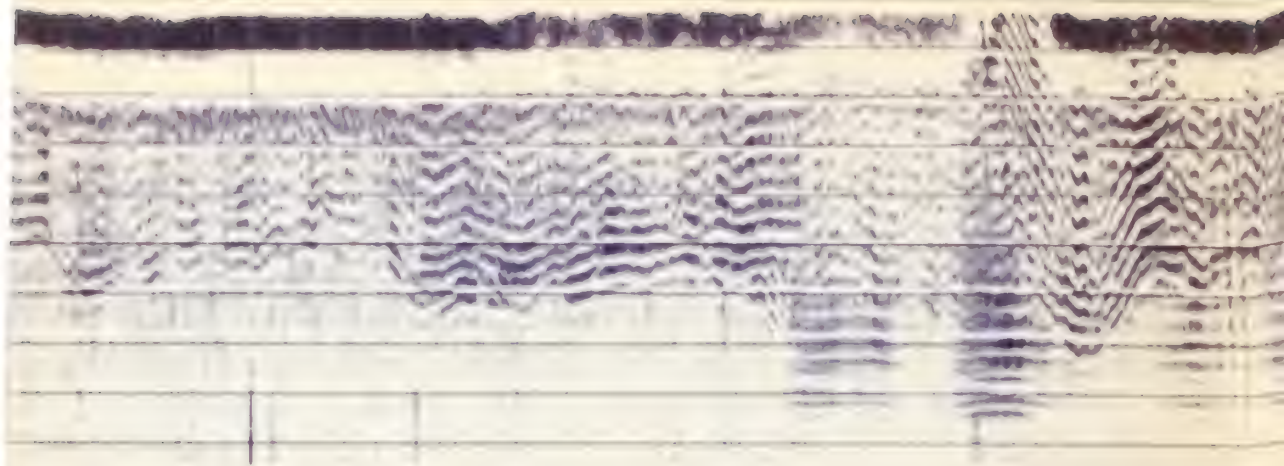
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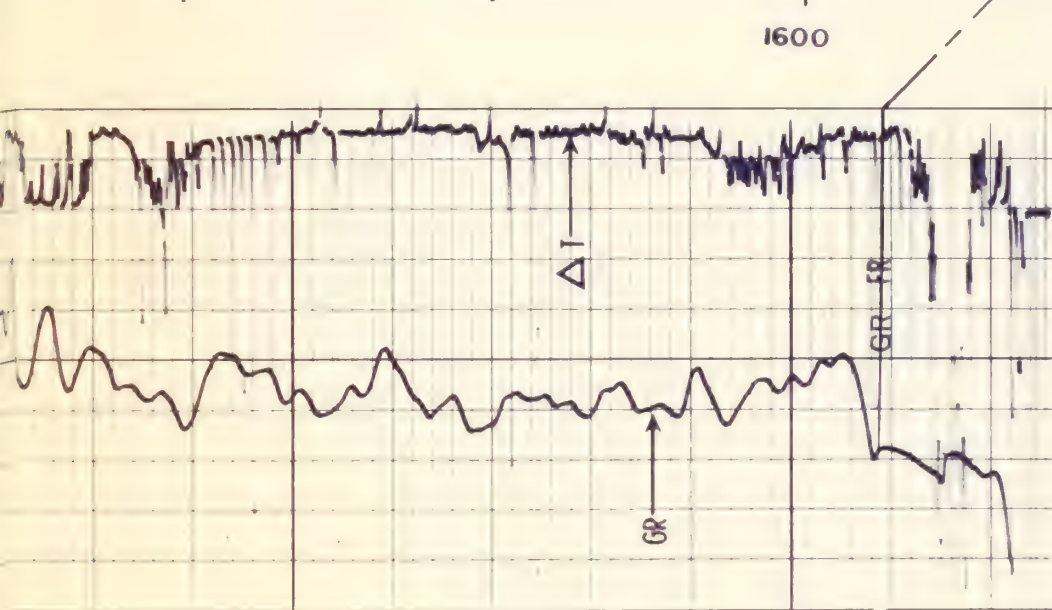
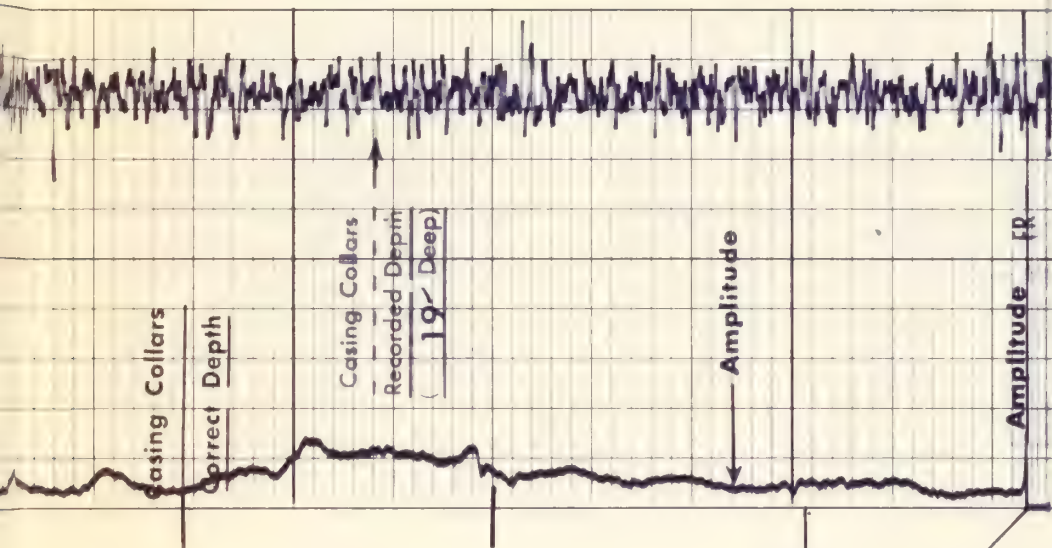
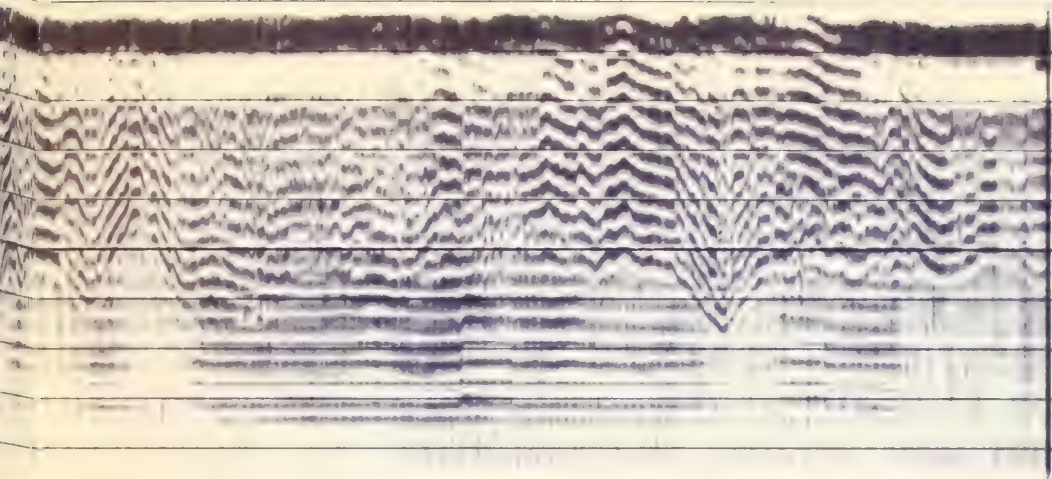
NO. 1
LONG
STRING







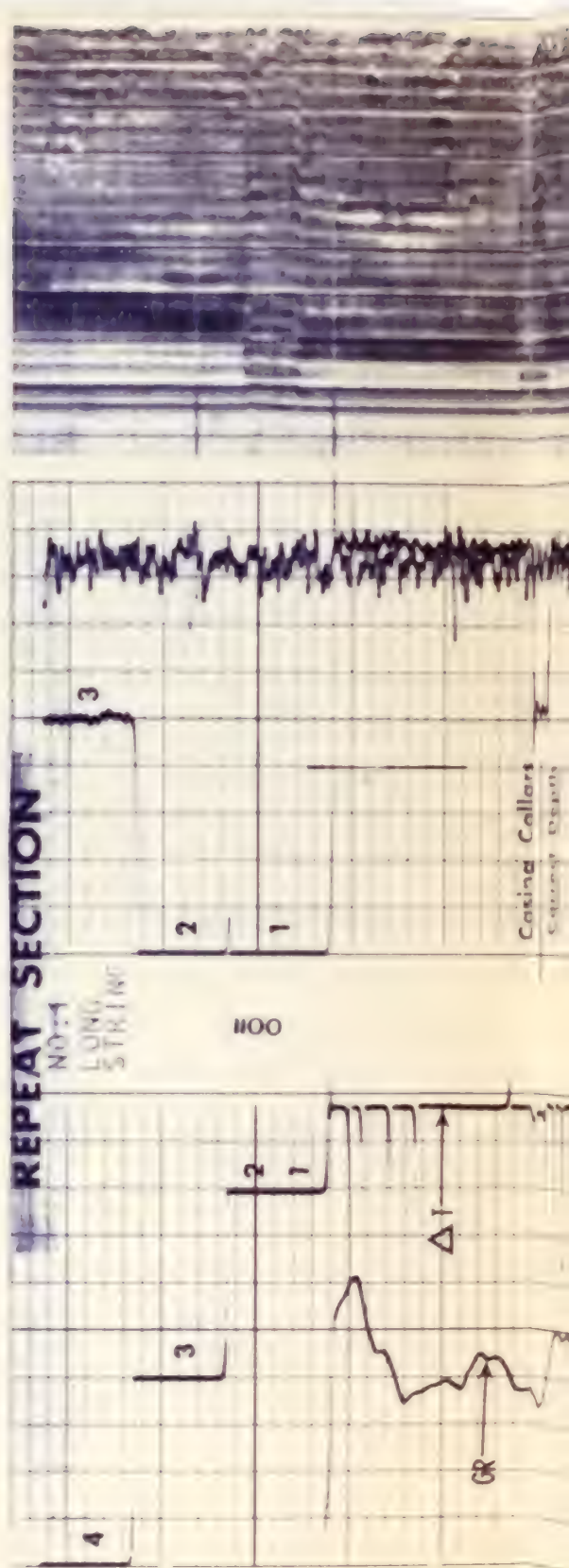


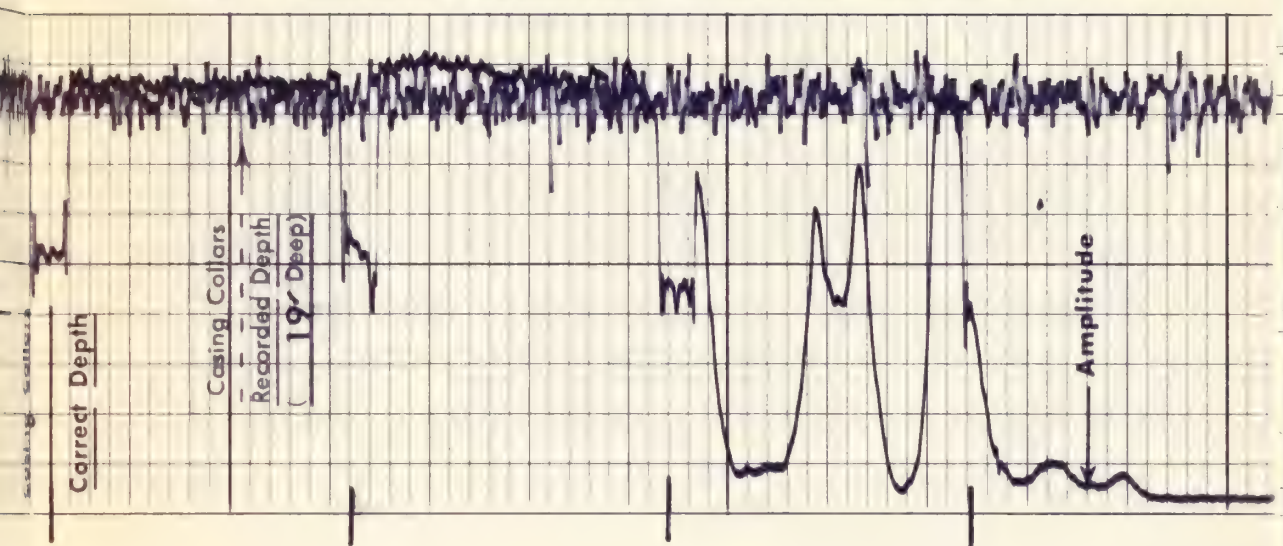
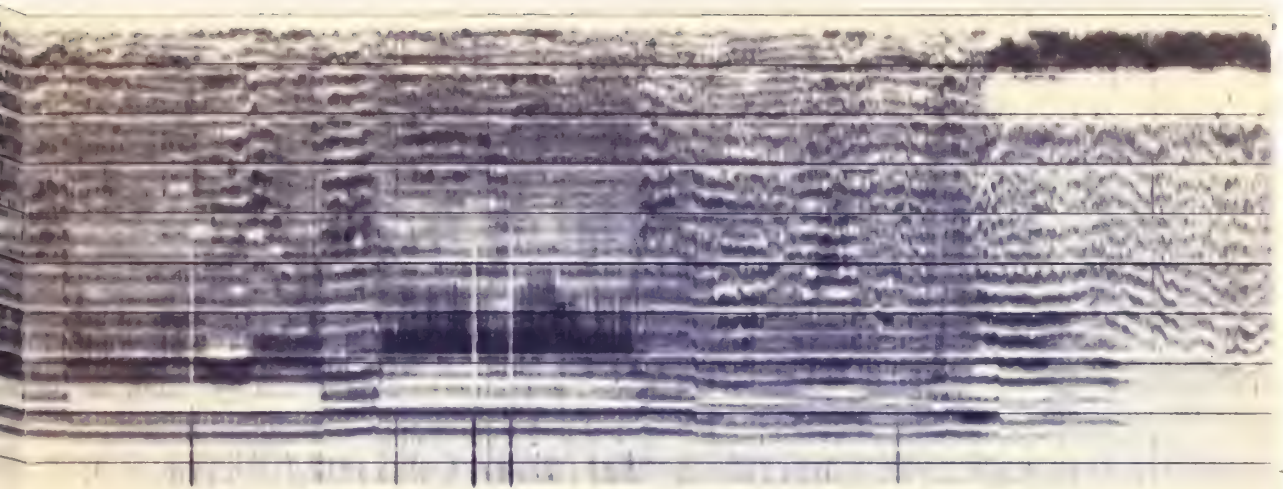


CALIBRATION BEFORE SURVEY

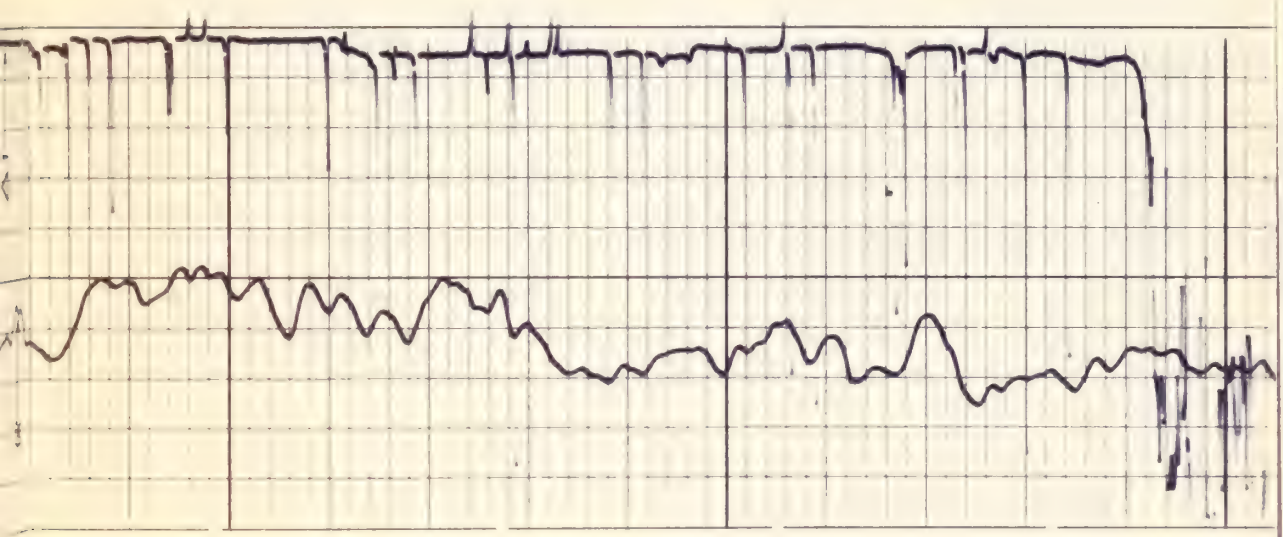


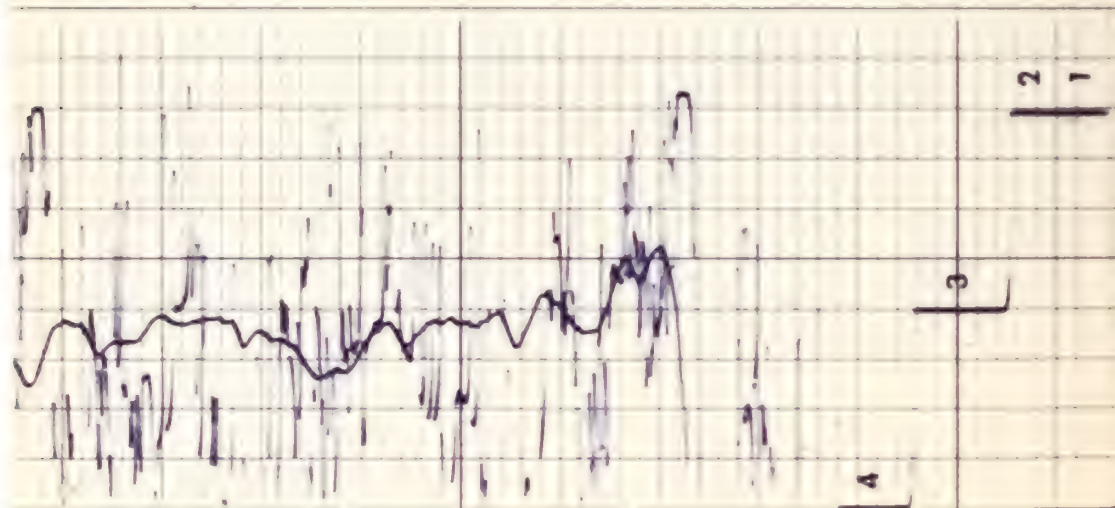
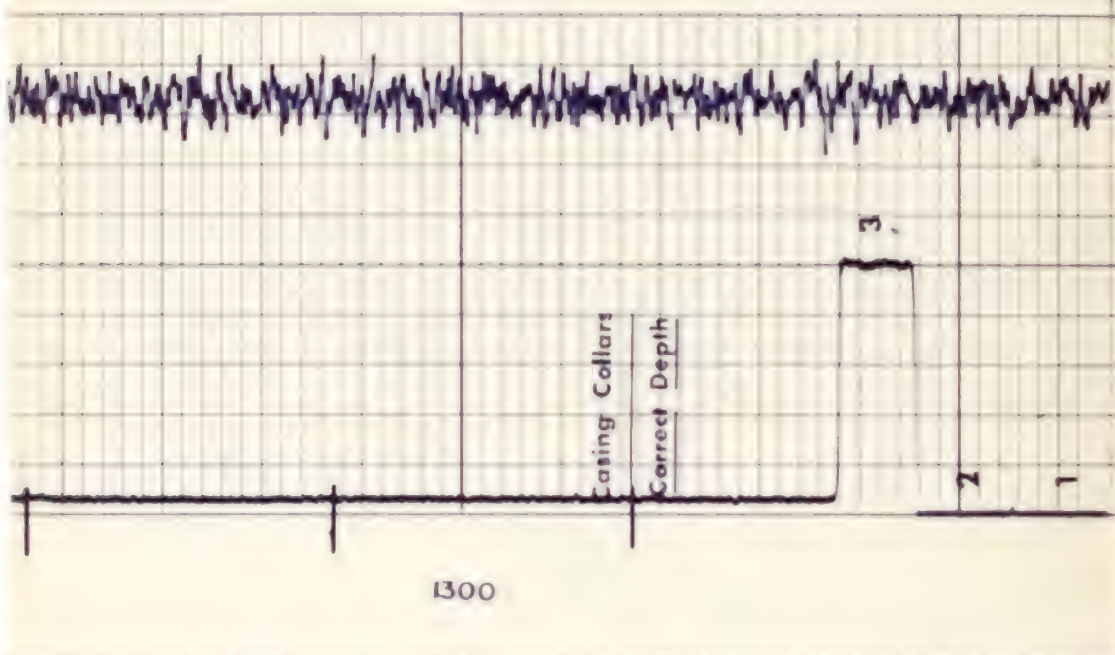
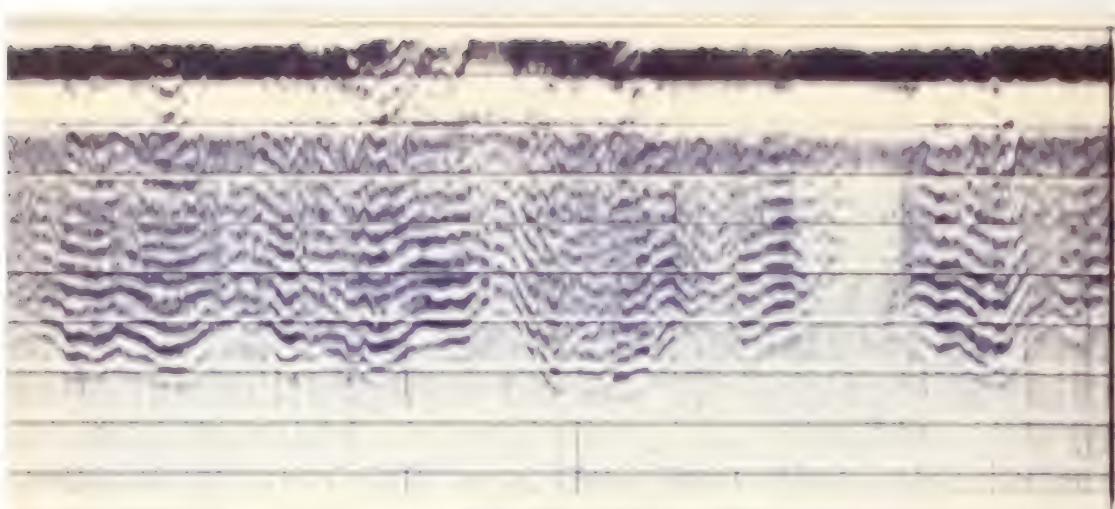
REPEAT SECTION





1200

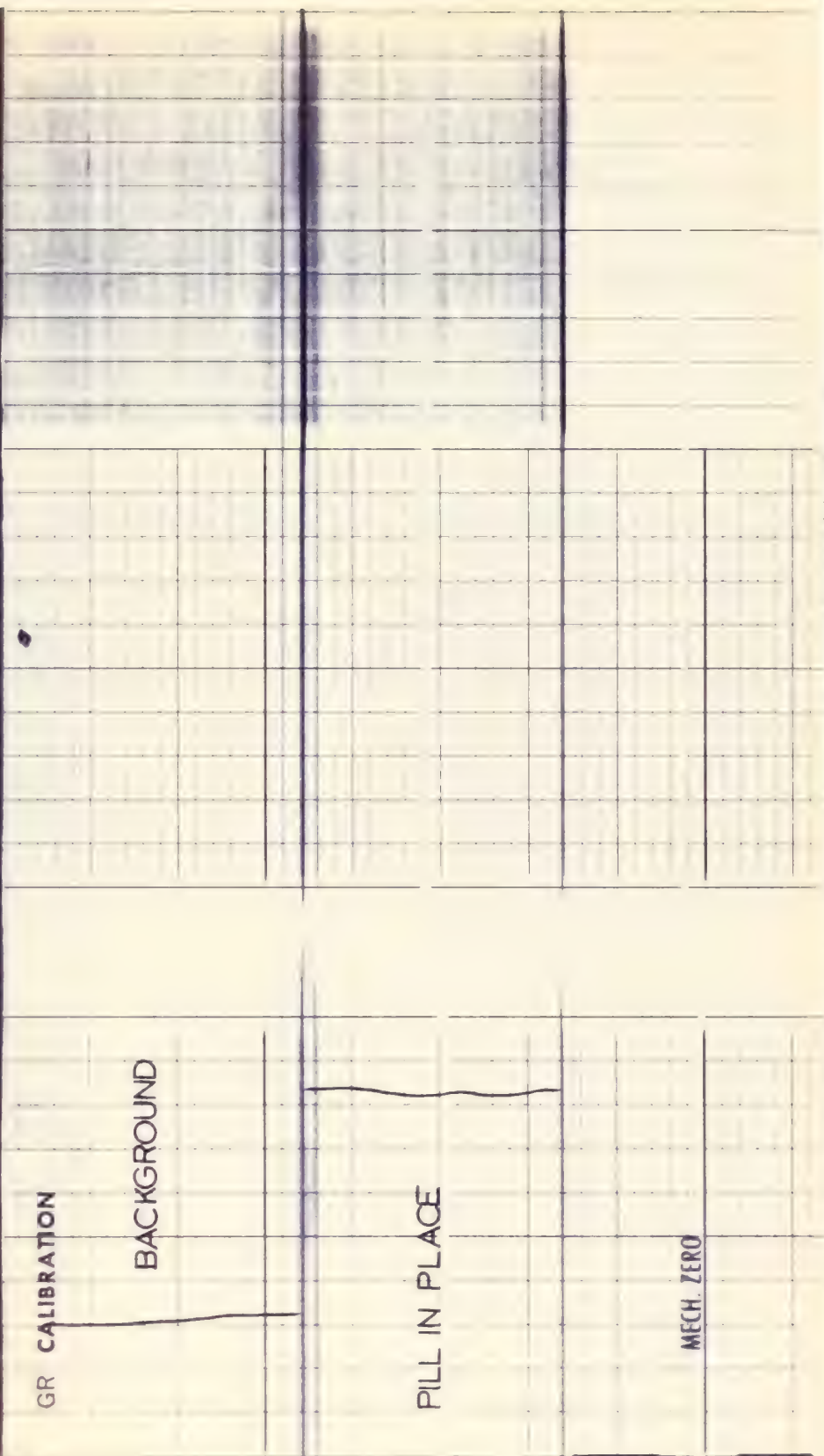


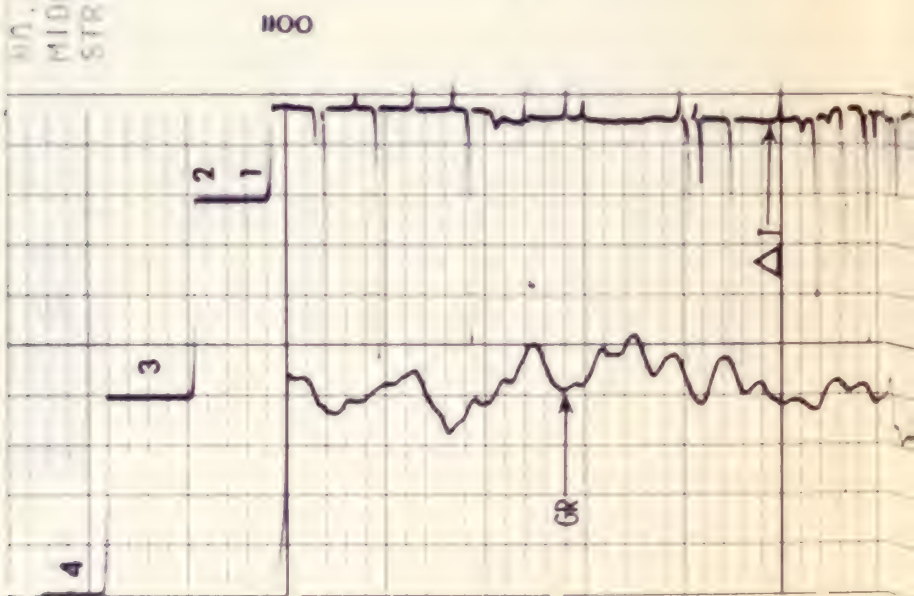
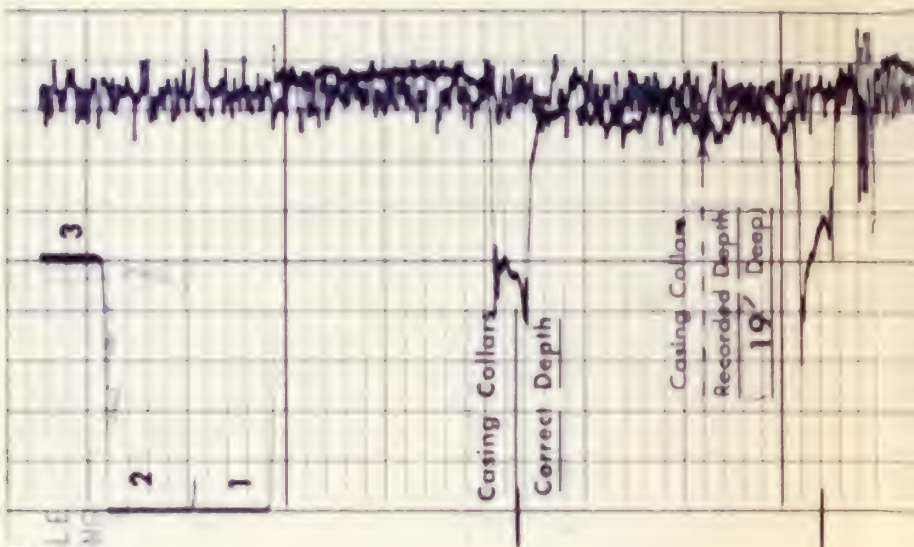
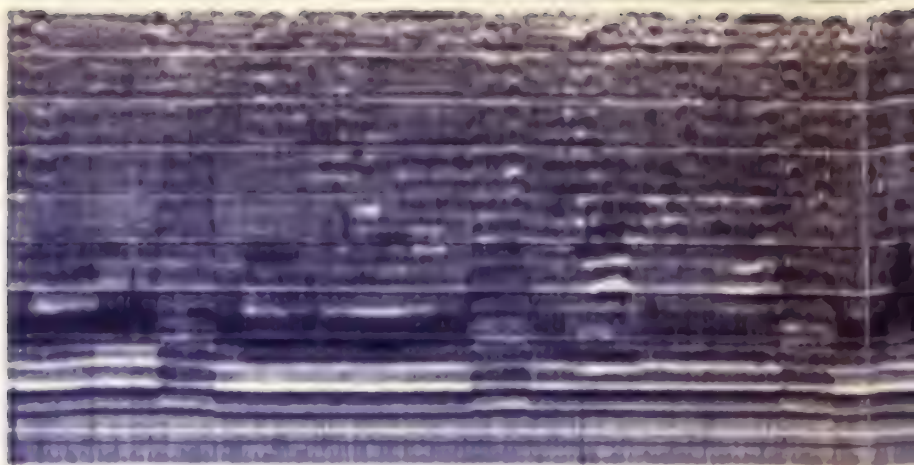


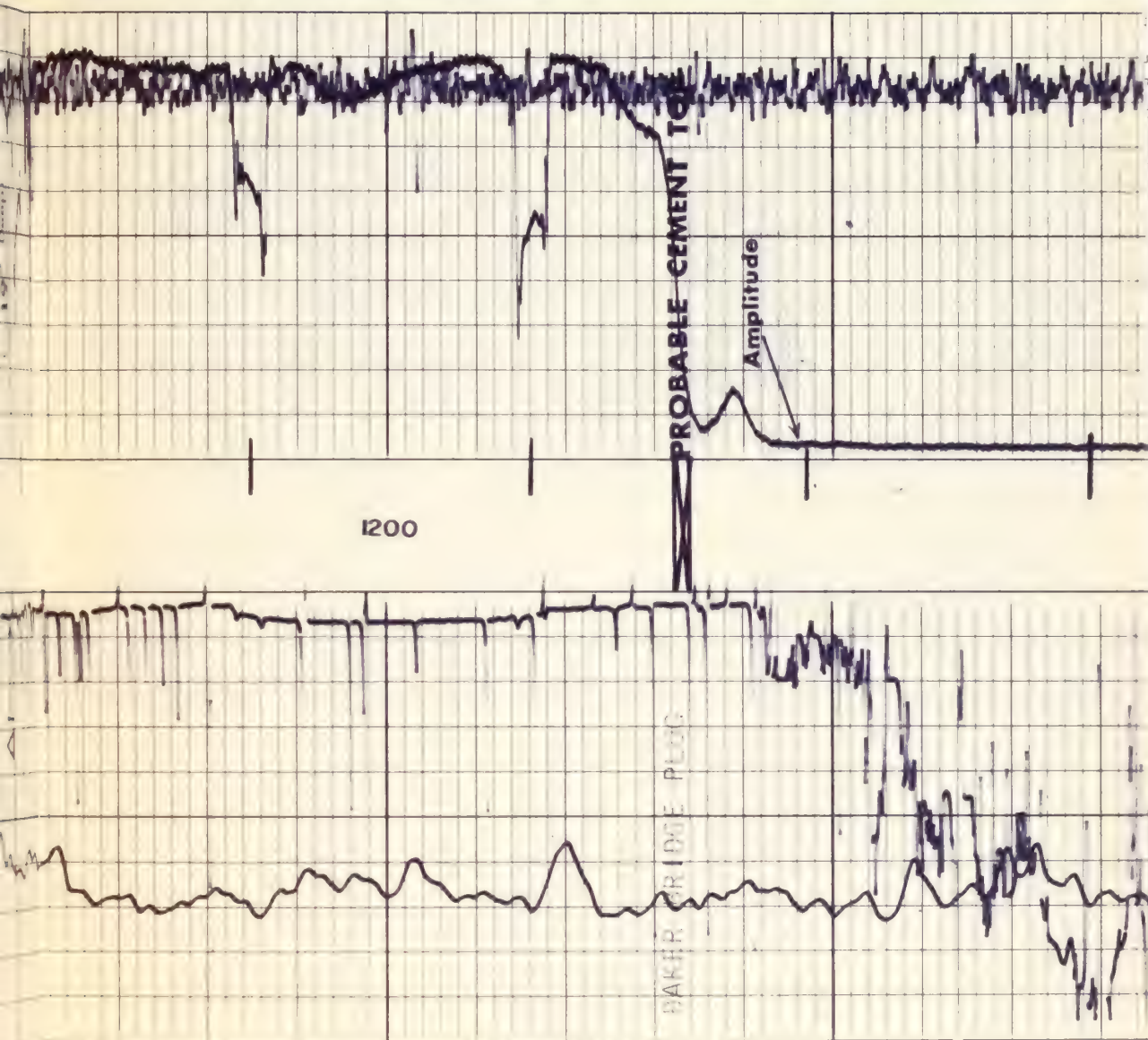
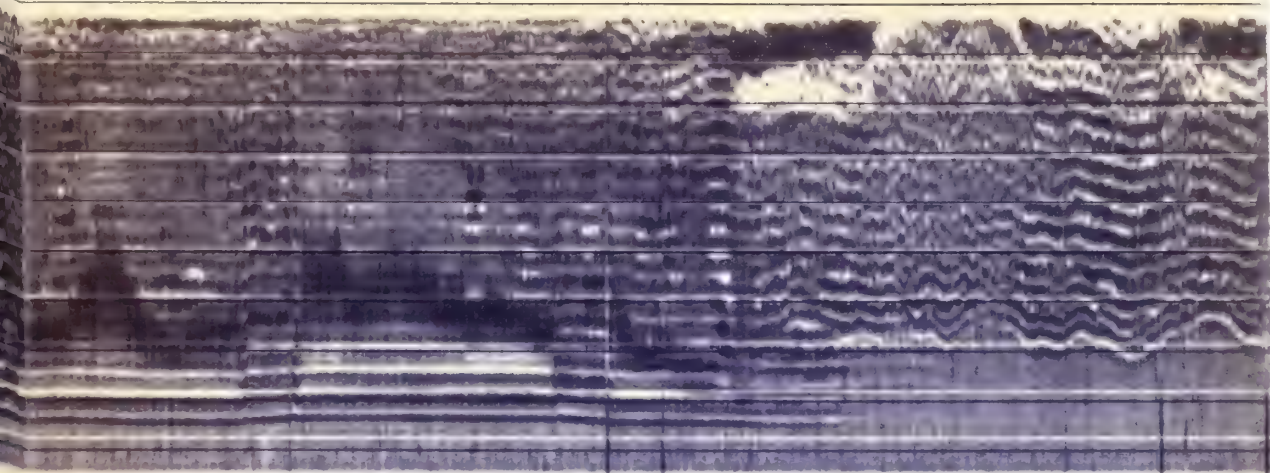
GAMMA RAY
API units

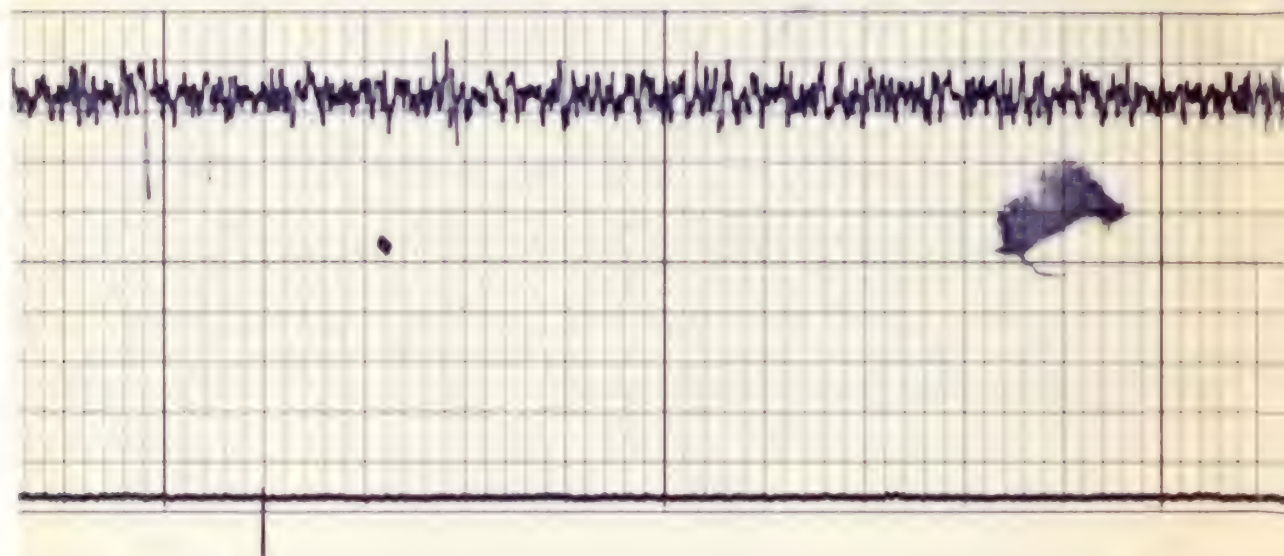
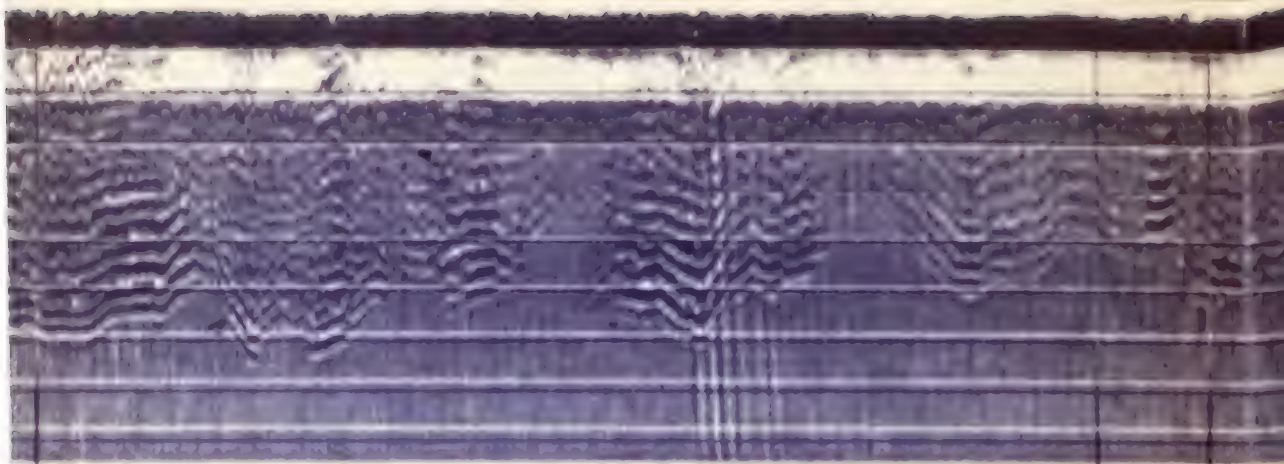
BONDING INCREASING

| | | | |
|------------------------------|--|------------------------|------------------------------|
| API units 400 200 | | BONDING INCREASES 0 | MICROSECONDS 100 200 1200 |
| TRANSIT TIME microseconds | | DEPTHS | 5 FOOT VARIABLE DENSITY |



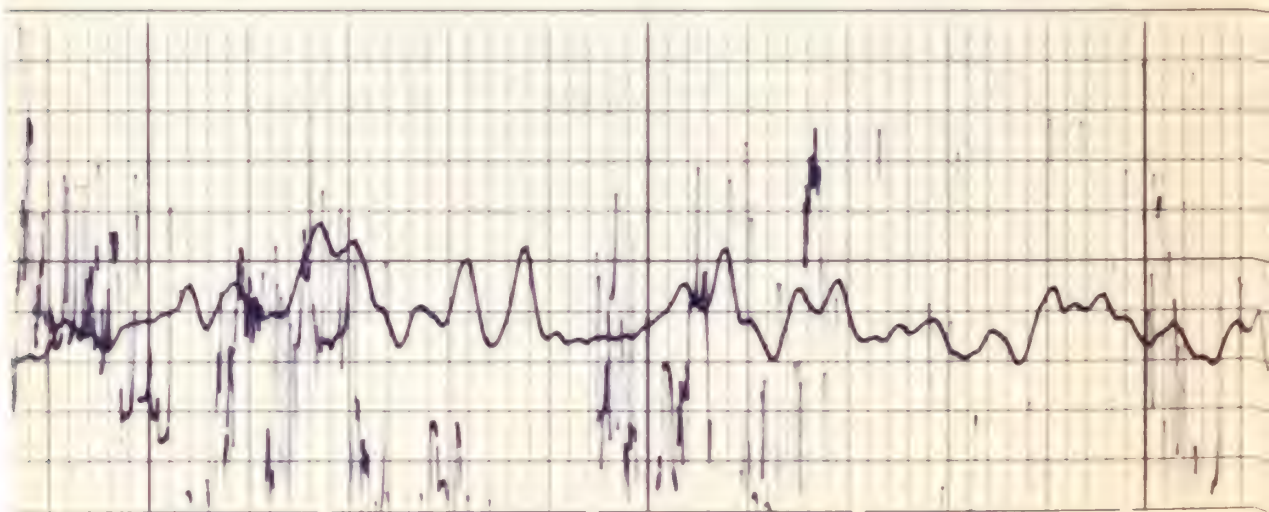


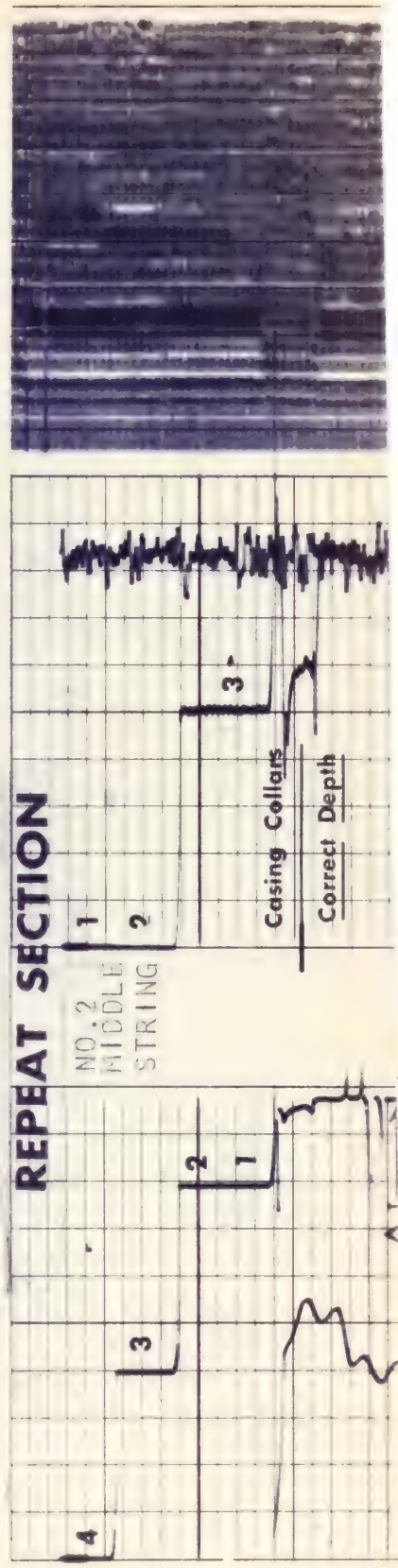
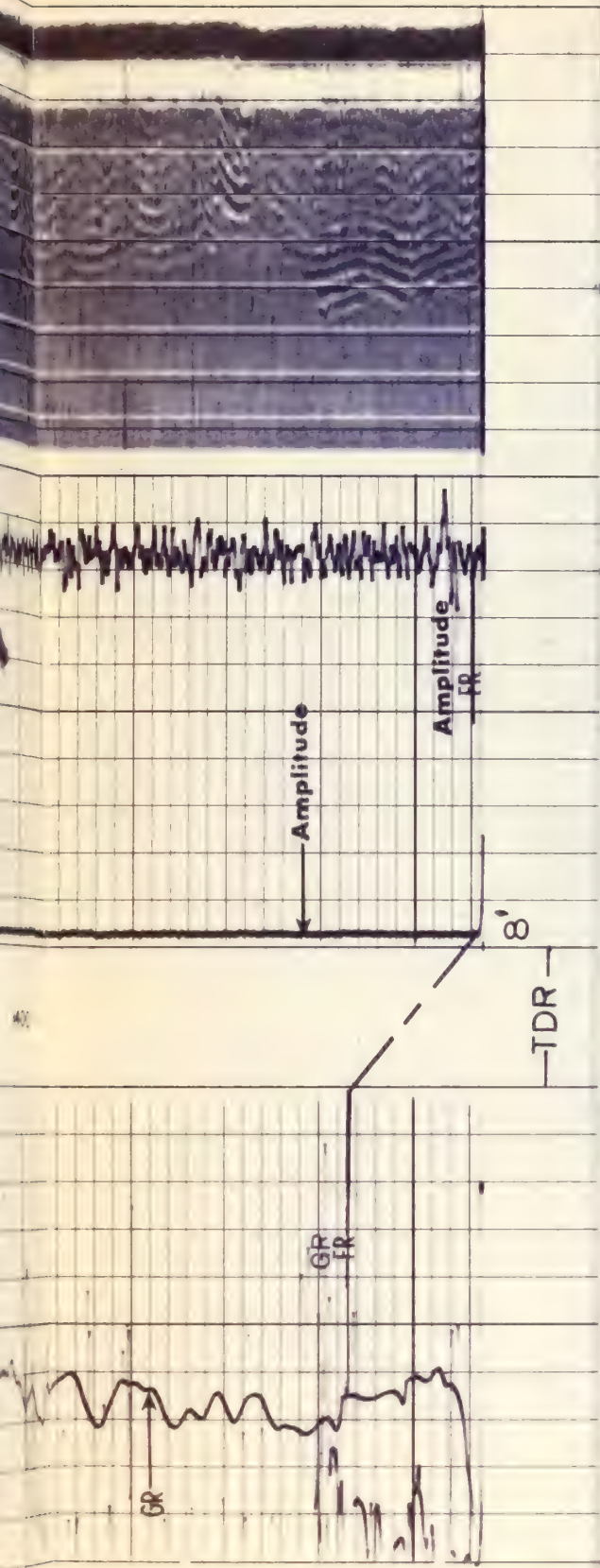


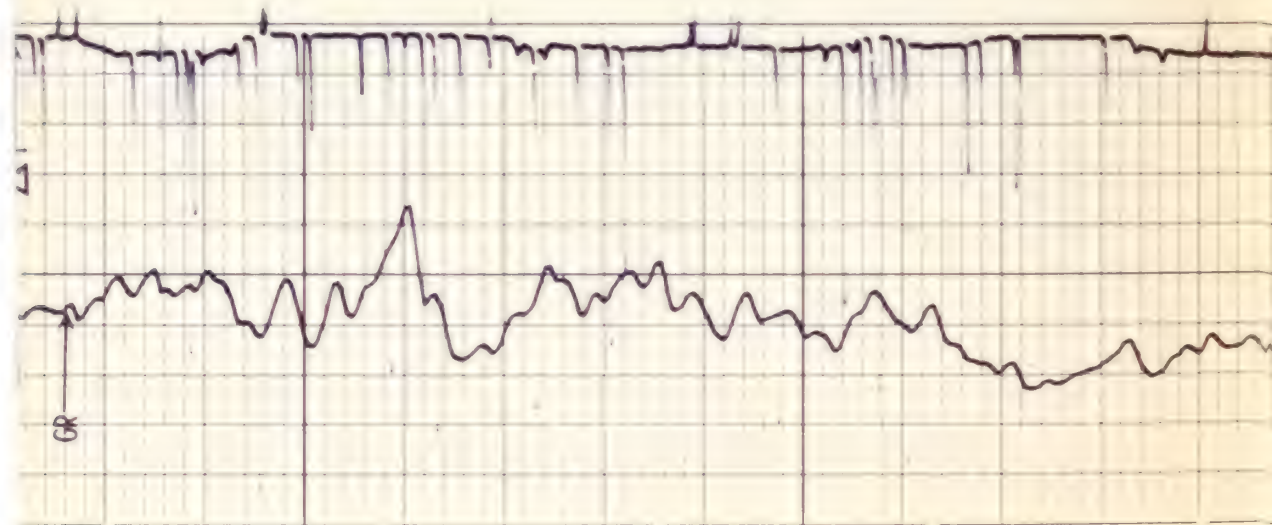
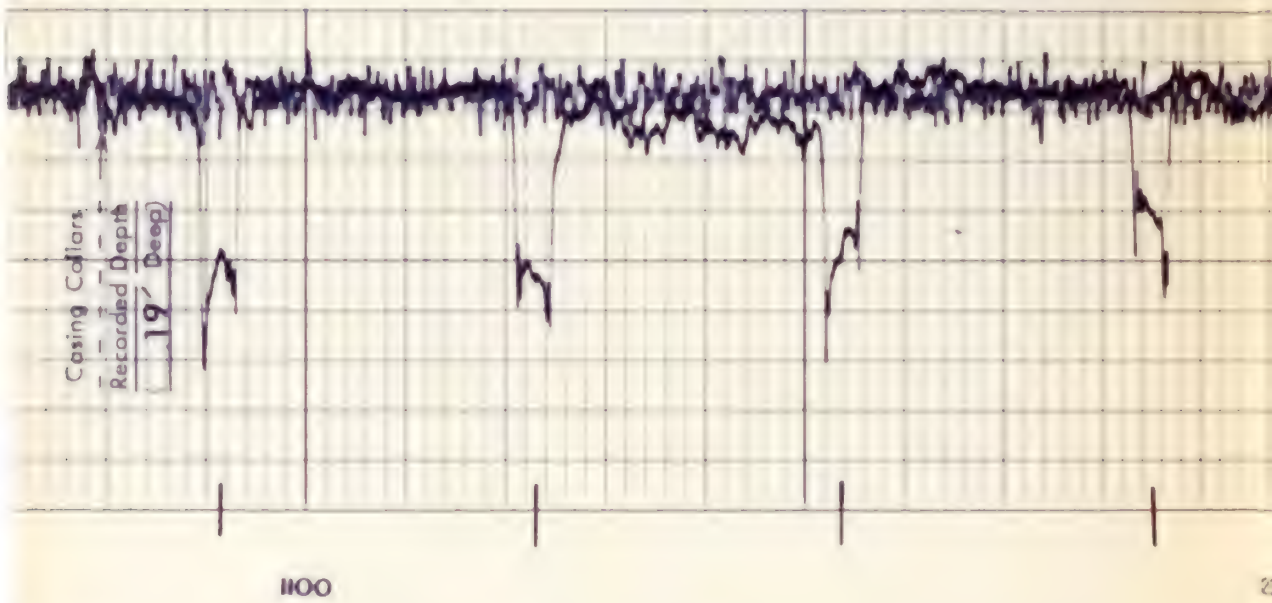
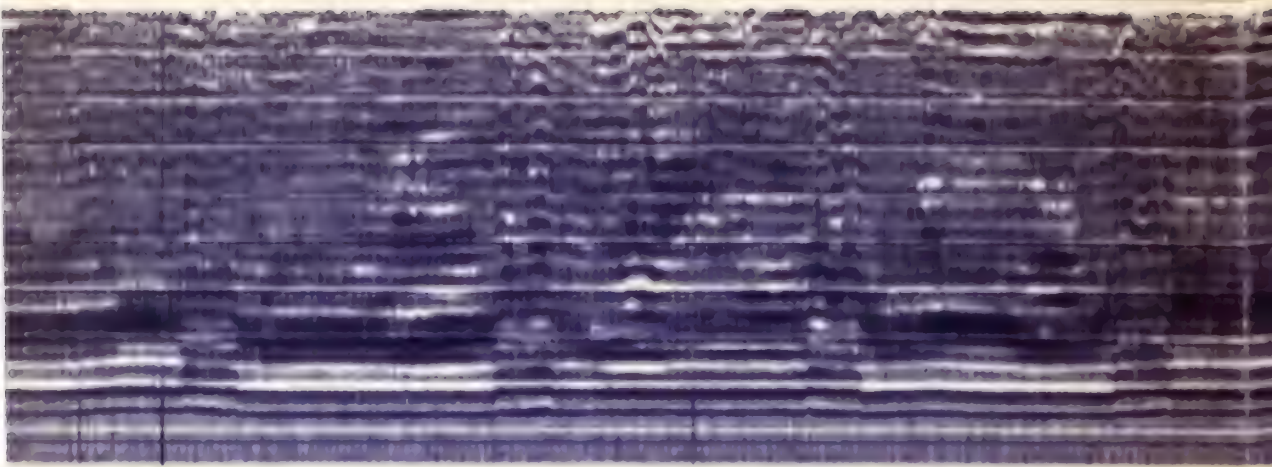


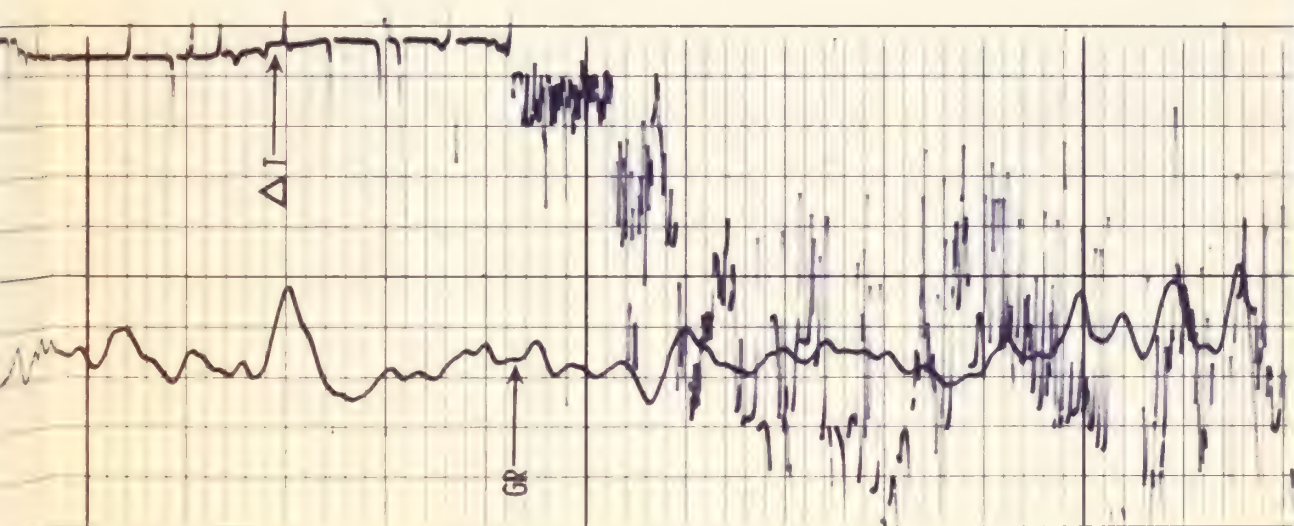
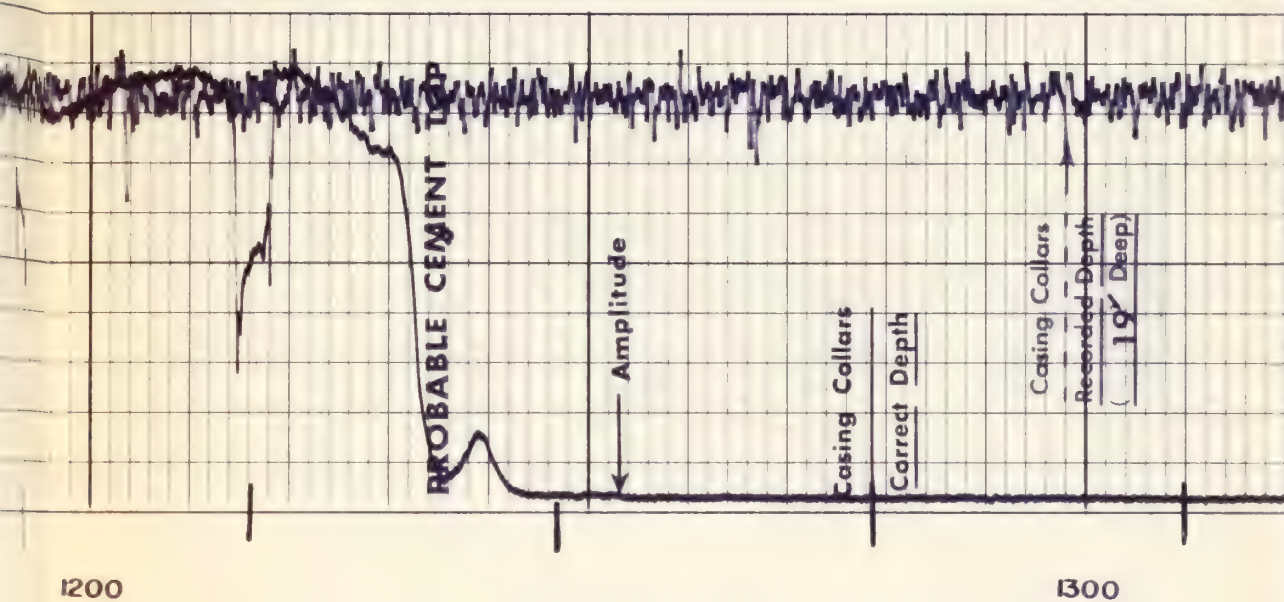
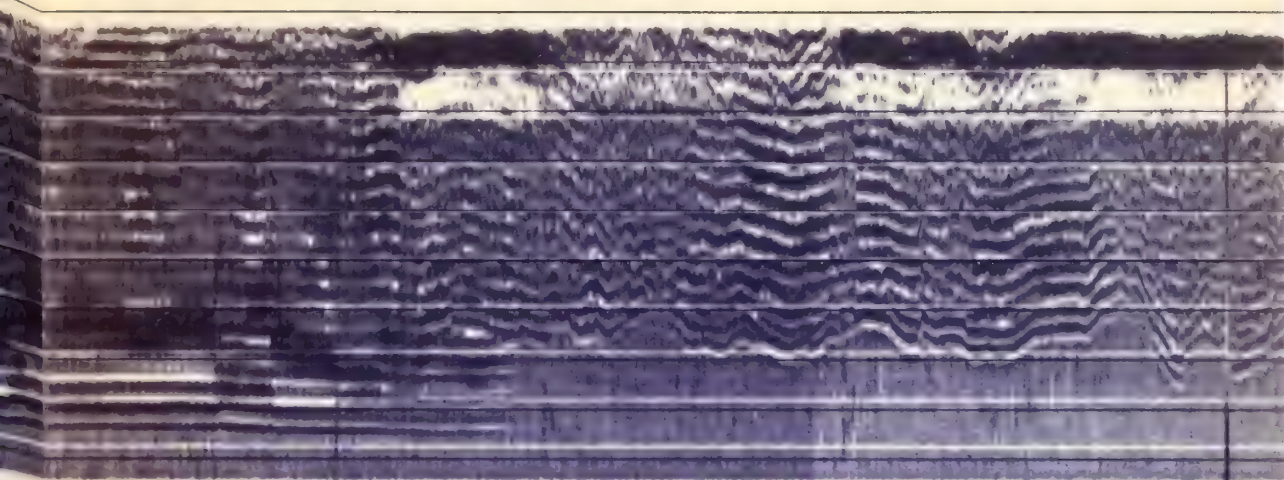
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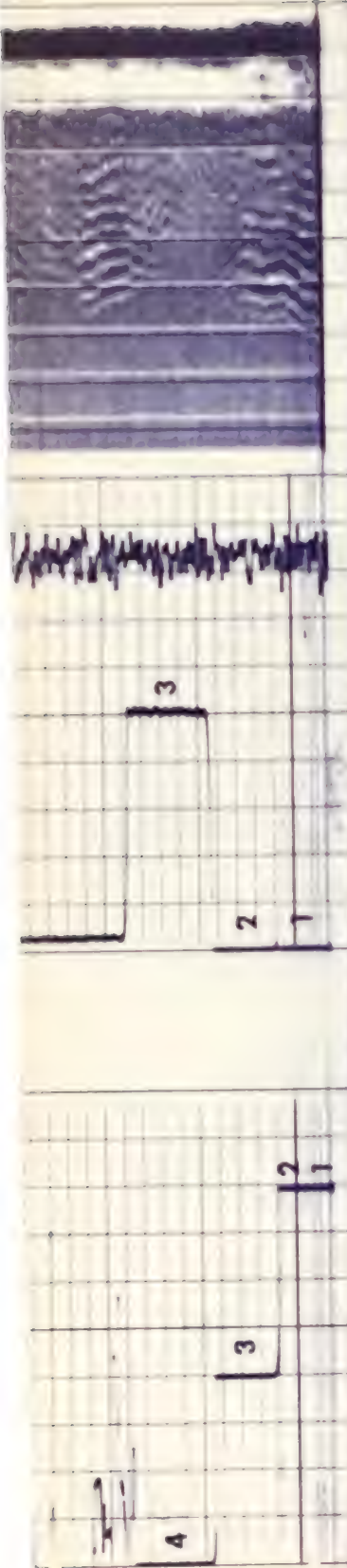
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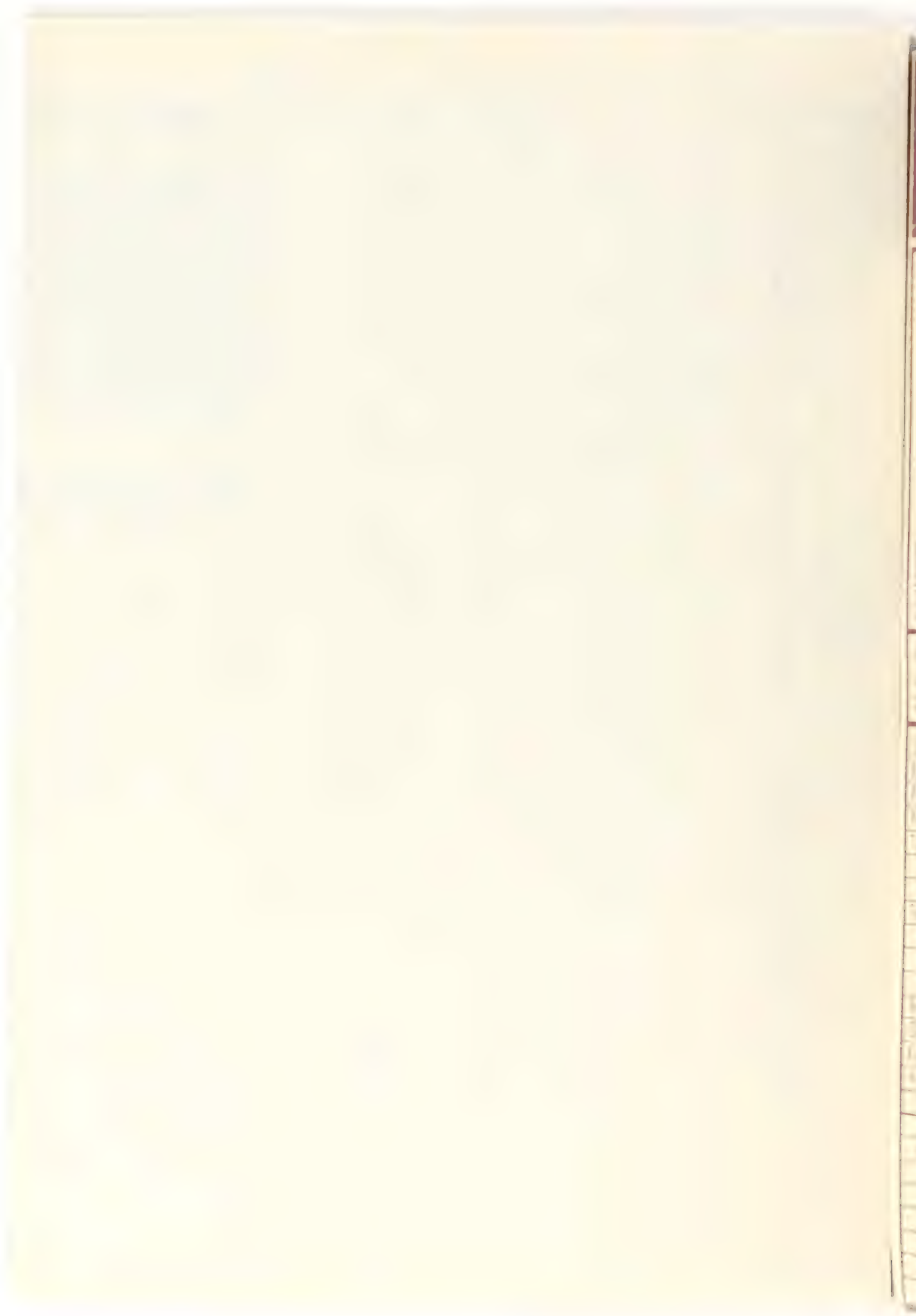
| | | | | | |
|--|--|---|--|--|--|
| TRANSIT TIME MICROSECONDS _____ SPACING _____ 400 _____ 200 _____ | | CASING BOND MILLIVOLTS _____ 0 _____ 100 _____ | | VARIABLE DENSITY MICROSECONDS _____ SPACING _____ 100 _____ 150 _____ | |
| GAMMA RAY API UNITS _____ _____ _____ | | DEPTH _____ _____ _____ | | | |

| | | | | | |
|---------|----------------------------|----------|----------|------|--|
| COMPANY | ATLANTIC RICHFIELD COMPANY | | | | |
| WELL | AT-1B | SCHL. FR | 1023 | 1456 | |
| | | SCHL. TD | 1031 | 1464 | |
| | | DRLR TD | 1632 | 1456 | |
| FIELD | | Elev: | | | |
| | | KB | ---- | | |
| | | DF | ---- | | |
| COUNTY | RIO BLANCO | STATE | COLORADO | | |
| | | GL | 6909 | | |

100
C-1

AMPLITUDE

- | | |
|----|-----------------|
| 1. | MECHANICAL ZERO |
| 2. | 240 μ sec |
| 3. | 320 μ sec |
| 4. | 400 μ sec |
- MECHANICAL ZERO
ELECTRICAL ZERO
CALIBRATE



Schlumberger**ORIENTED PERFORATING RECORD
AND CASING COLLAR LOG**COMPANY ATLANTIC RICHFIELD COMPANYWELL AT-1

FIELD _____

COUNTY RI STATE CONNECTICUT

Location:

Sec. _____ Twp. _____ Rge. _____

Other Services:

Permanent Datum: SEA LEVEL; Elev.: 0000
Log Measured From _____, _____ Ft. Above Perm. Datum
Drilling Measured From _____Elev.: K.B. _____
D.F. _____
G.L. _____

| | |
|--------------------|---------------|
| Date | 11-9-11 |
| Run No. | ONE |
| Pipe String No. | ONE-TWO-THREE |
| Pipe String Ident. | ONE-TWO-THREE |
| Type Orienting | POWER |

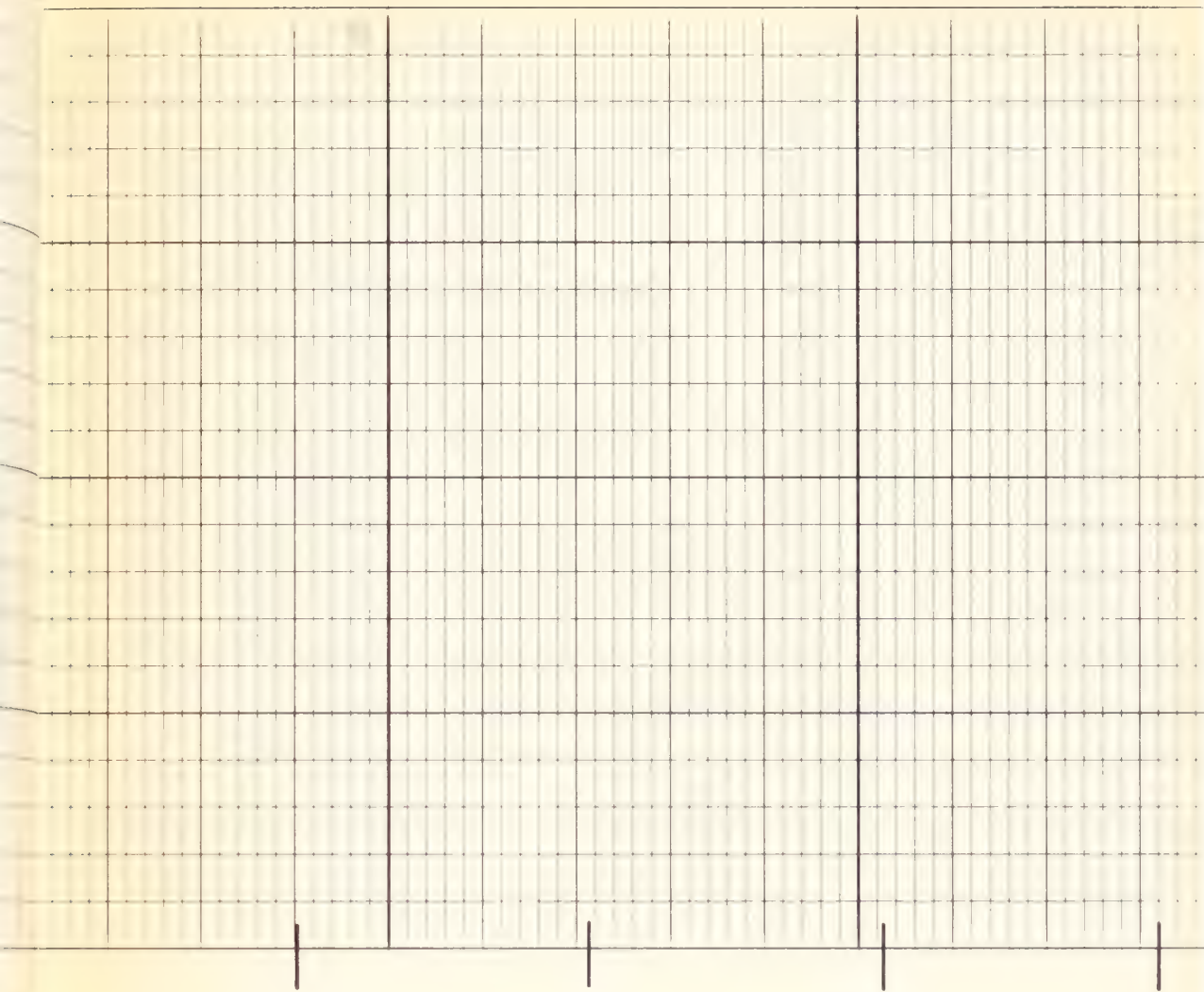
| | |
|--------------------|-------|
| Type fluid in hole | WATER |
| Salinity, PPM Cl. | |
| Density | |
| Level | FO |

Max rec. temp., deg F. _____

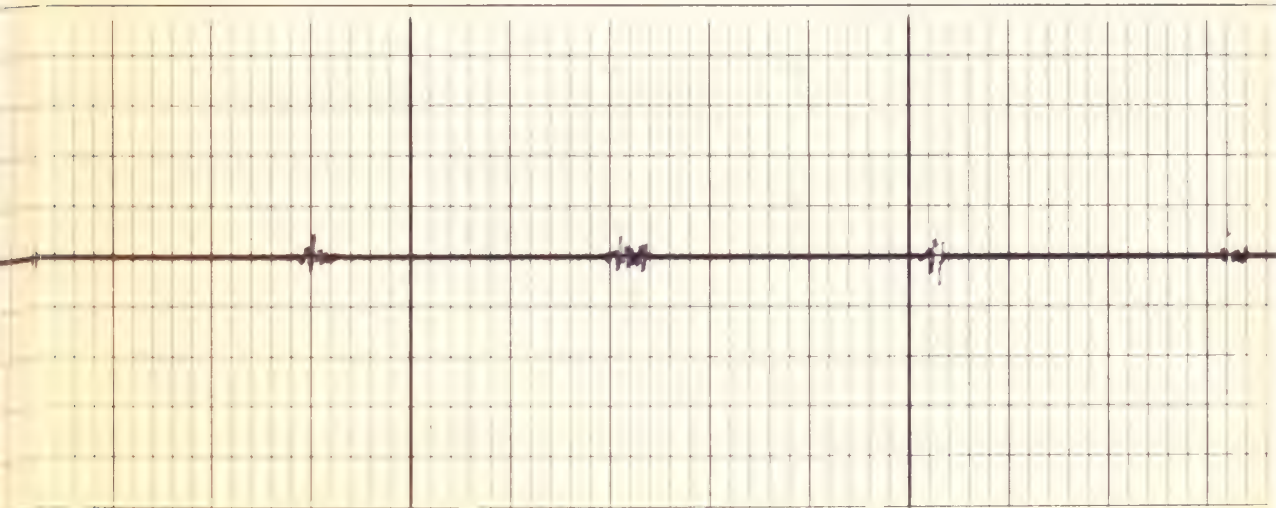
Operating rig time _____

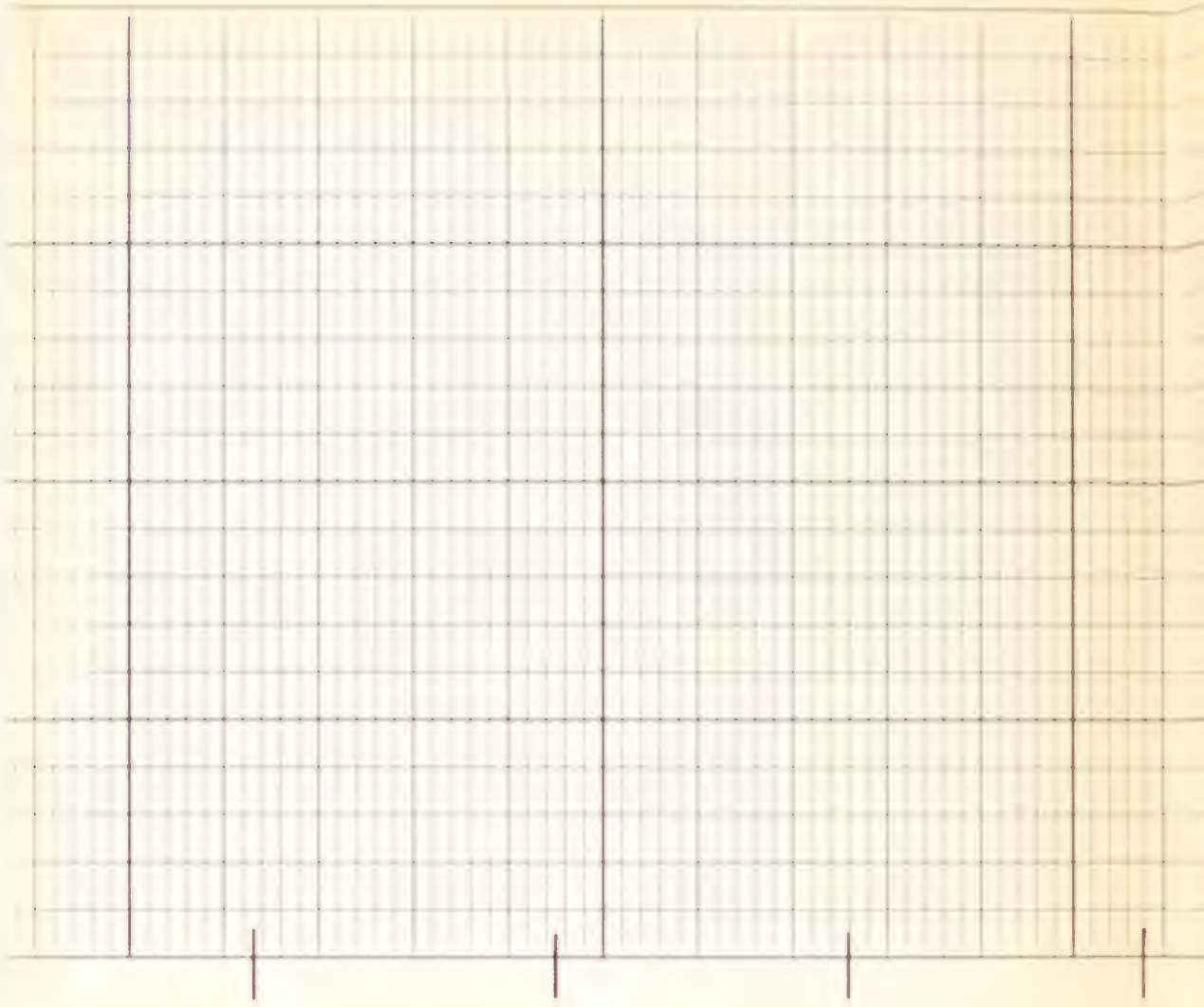
Recorded by J. A. AUSTINWitnessed by M. J. JONES**BORE-HOLE RECORD****CEMENTING RECORD**

| Bit | From | To | Type | Wgt. | From | To |
|-----|------|----|---------|------|------|-----|
| | | | Primary | | 1 | 100 |
| | | | Squeeze | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

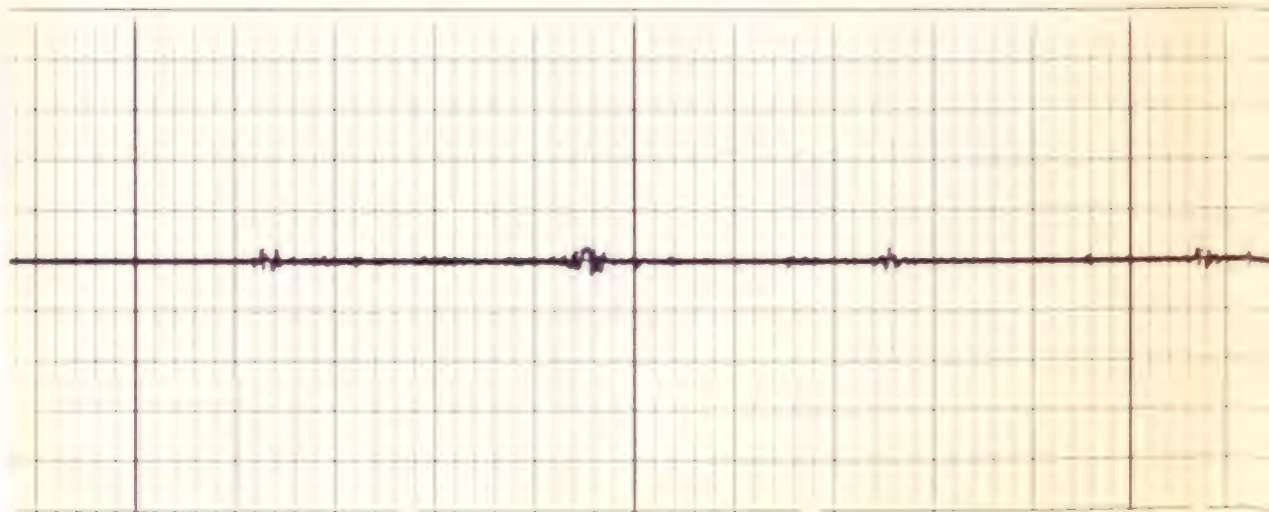


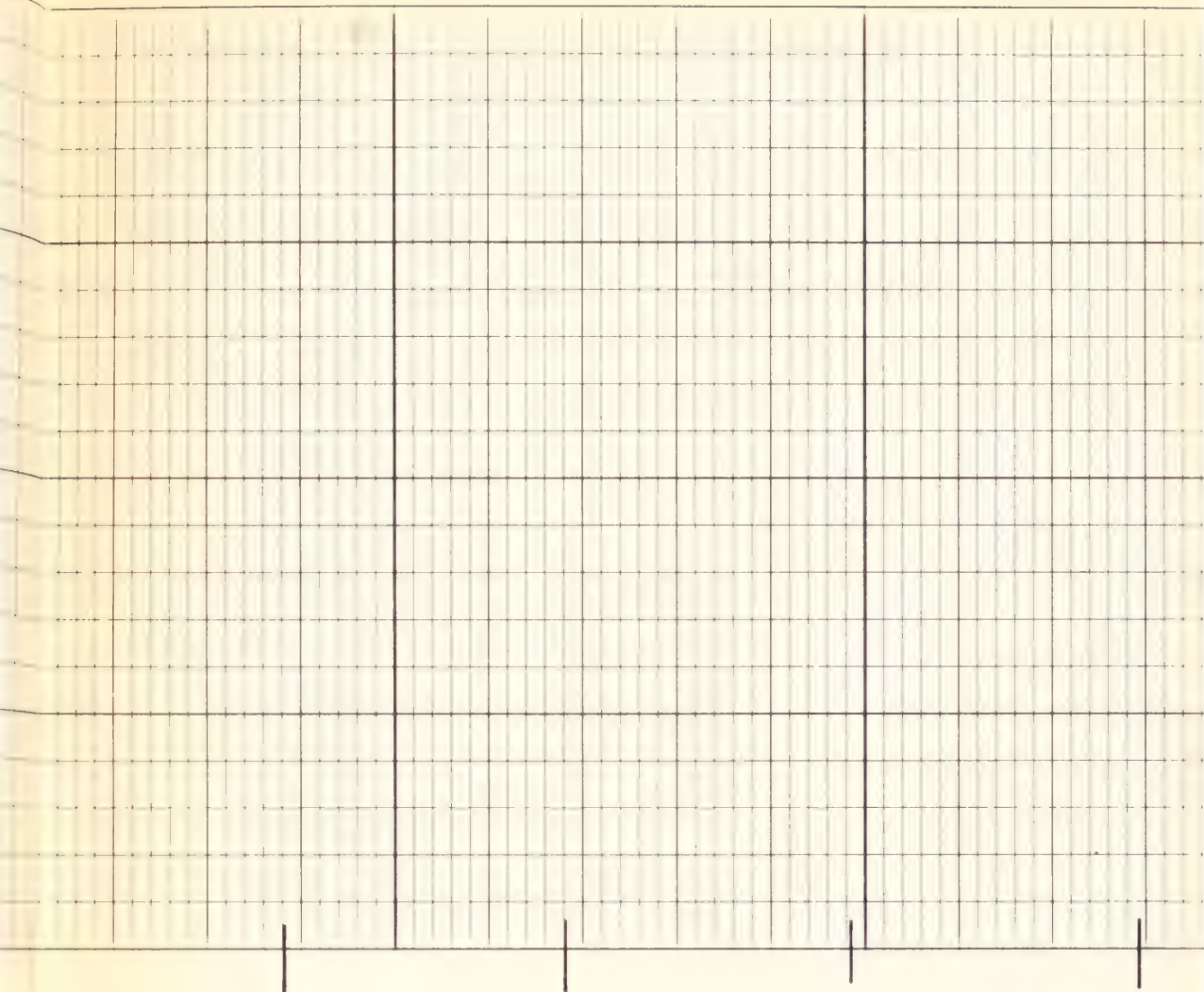
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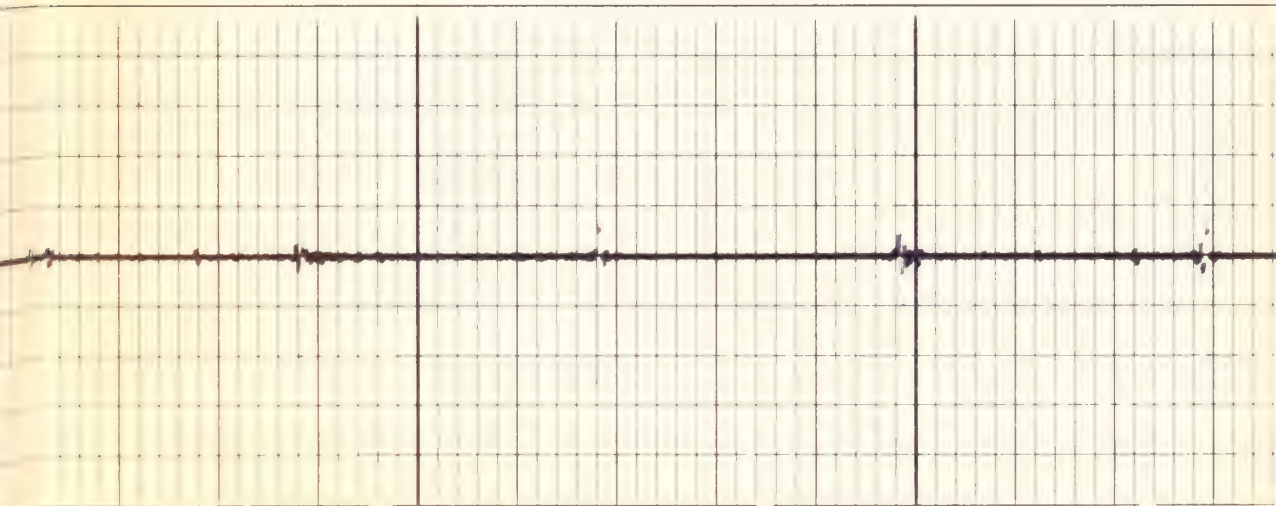


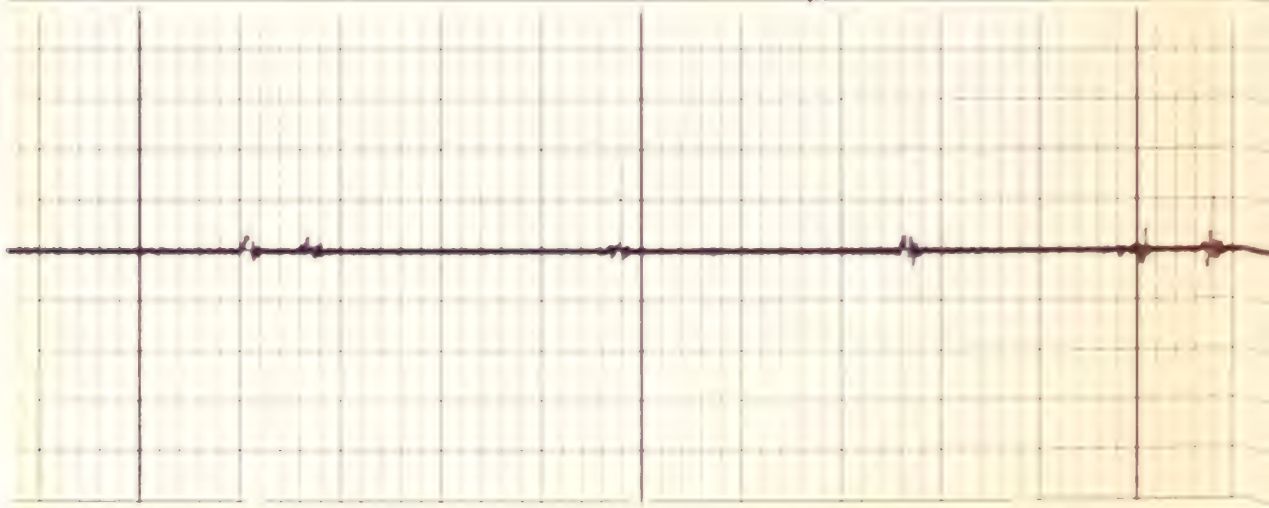
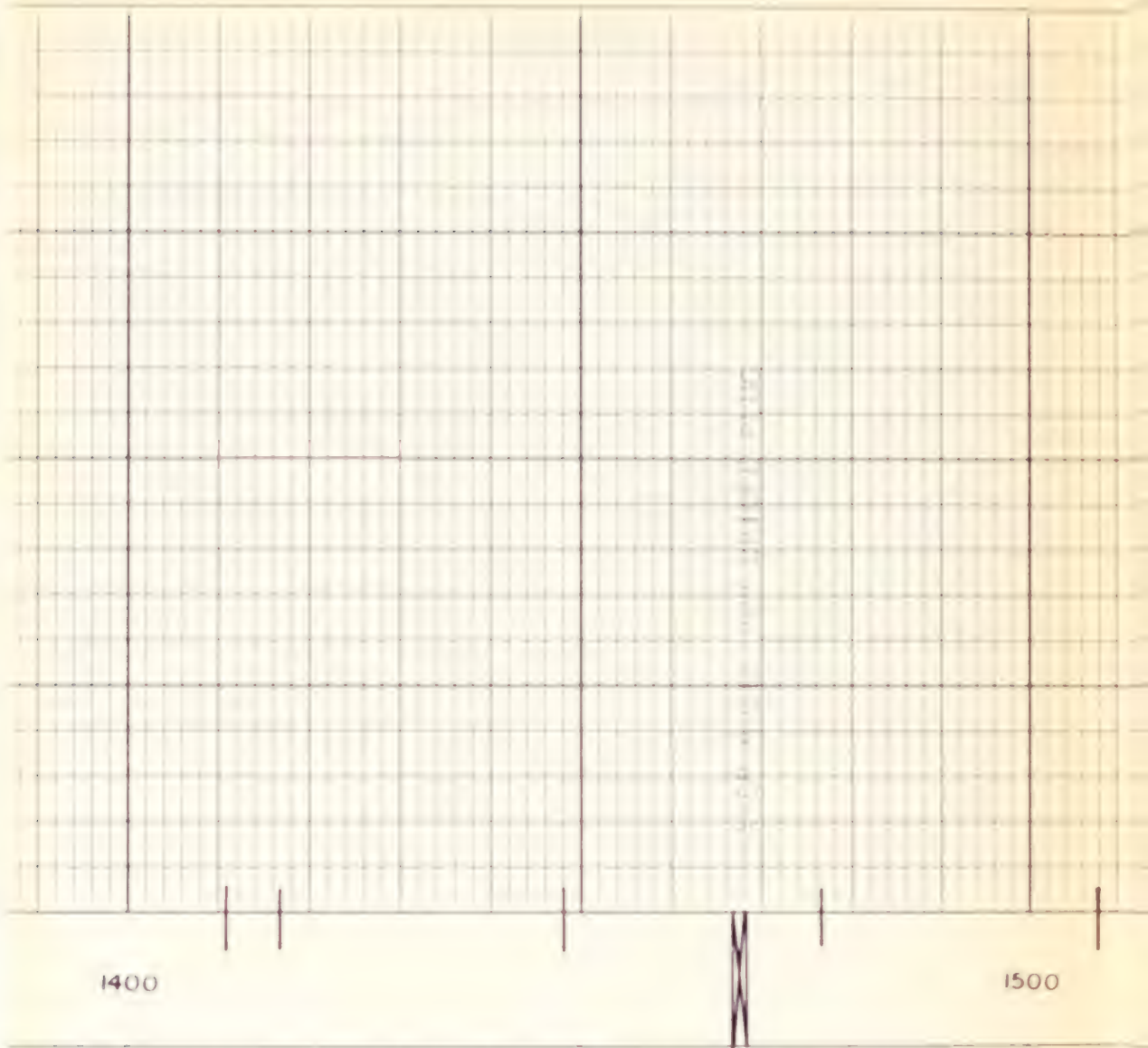
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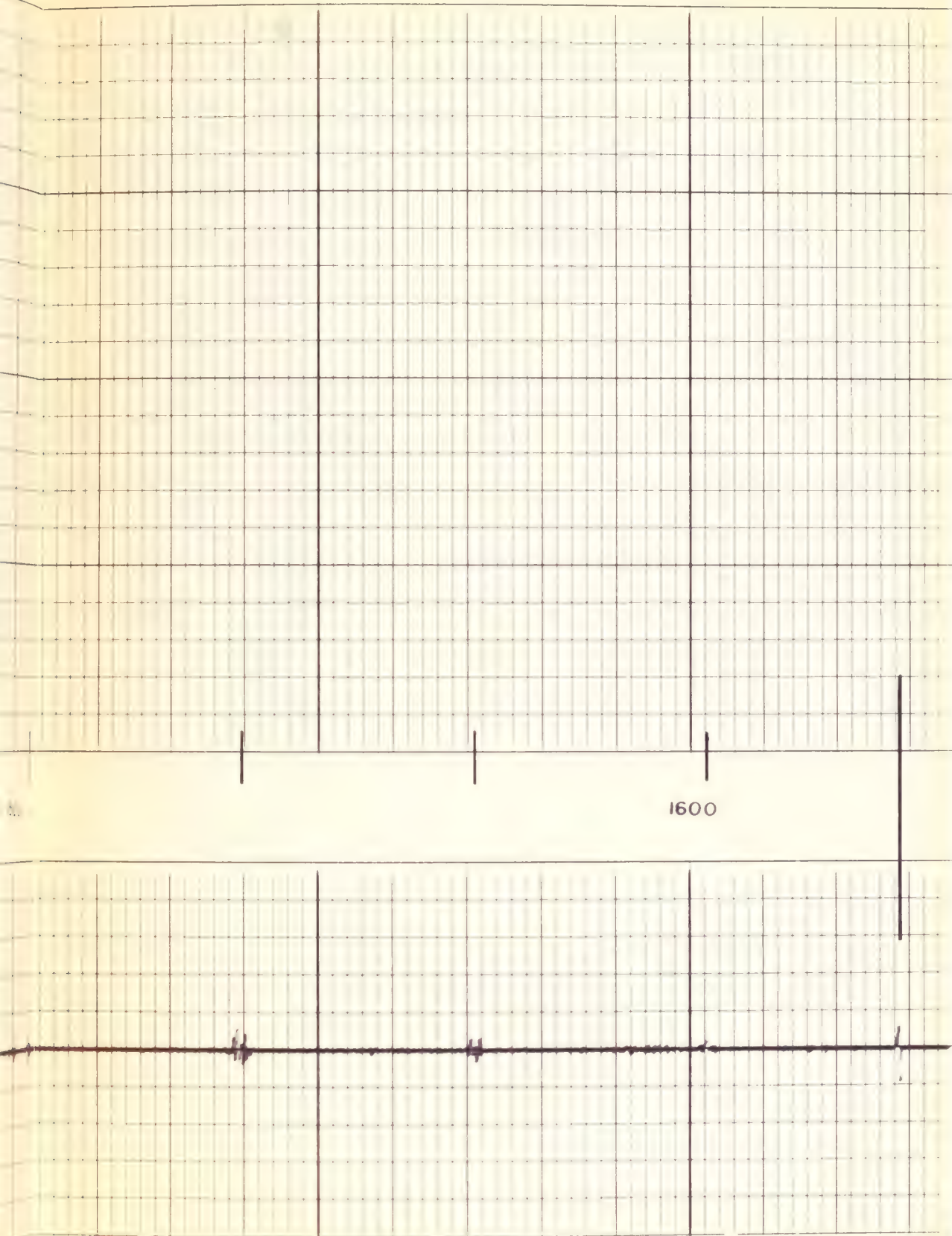




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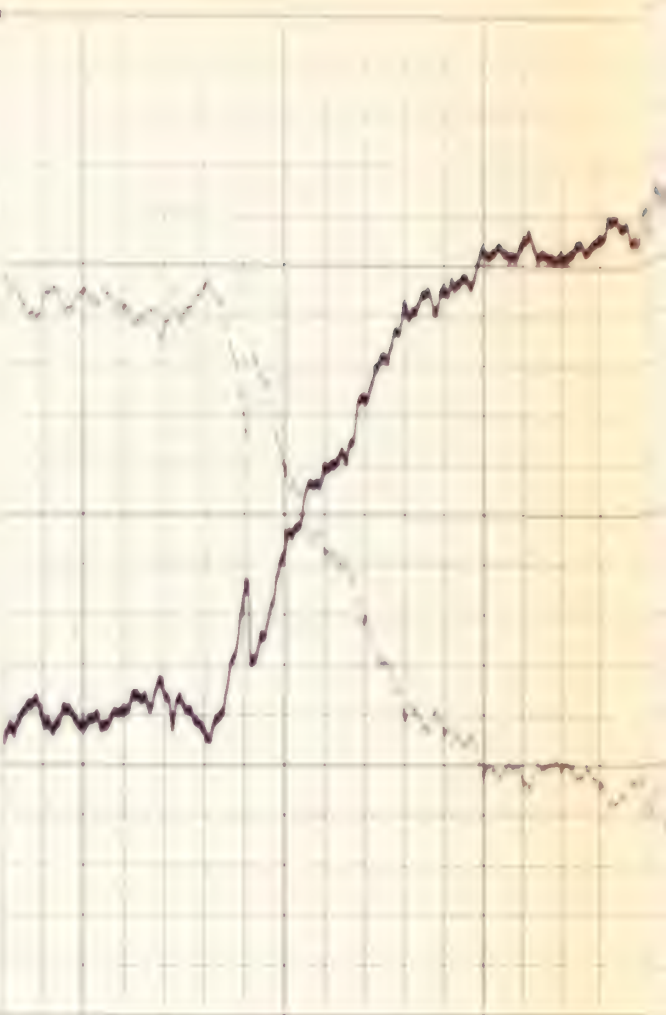
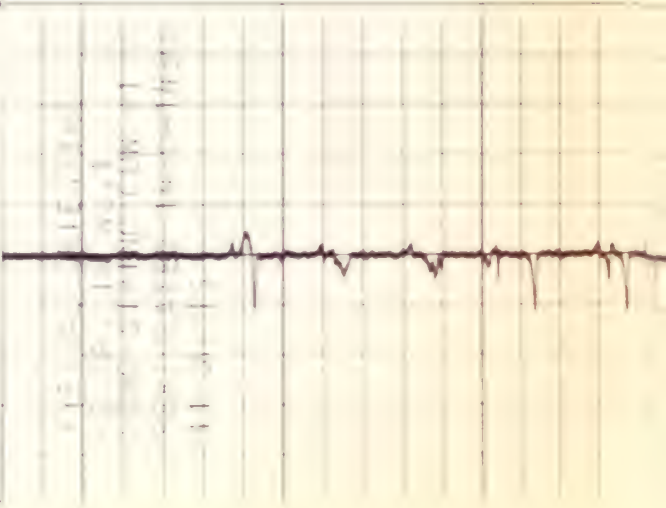
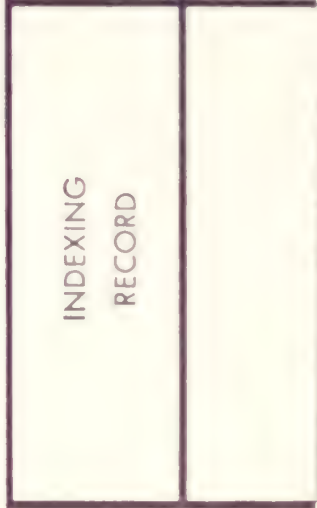


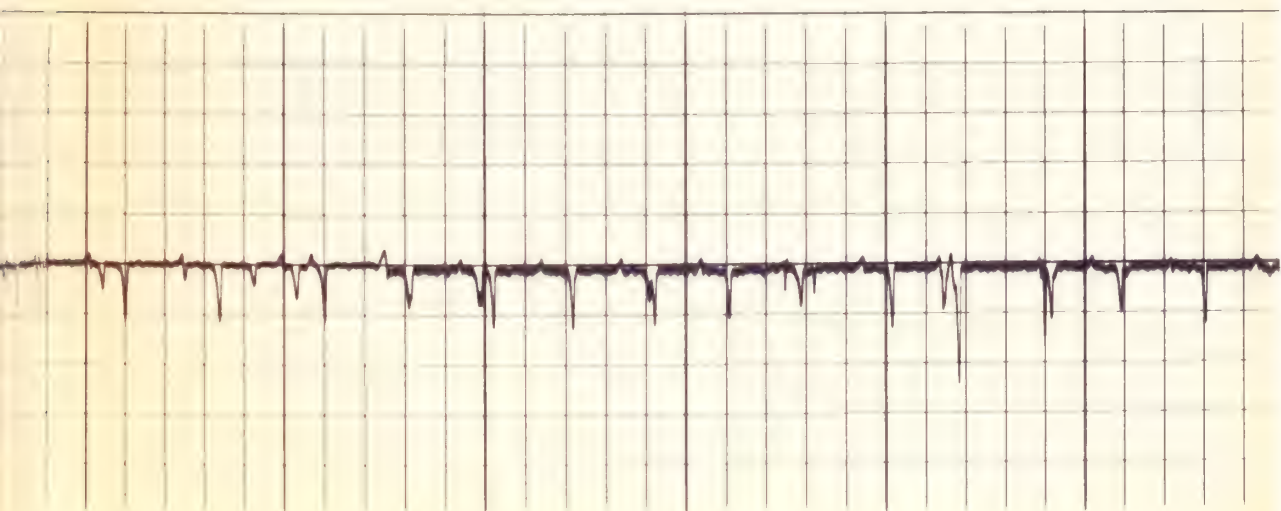
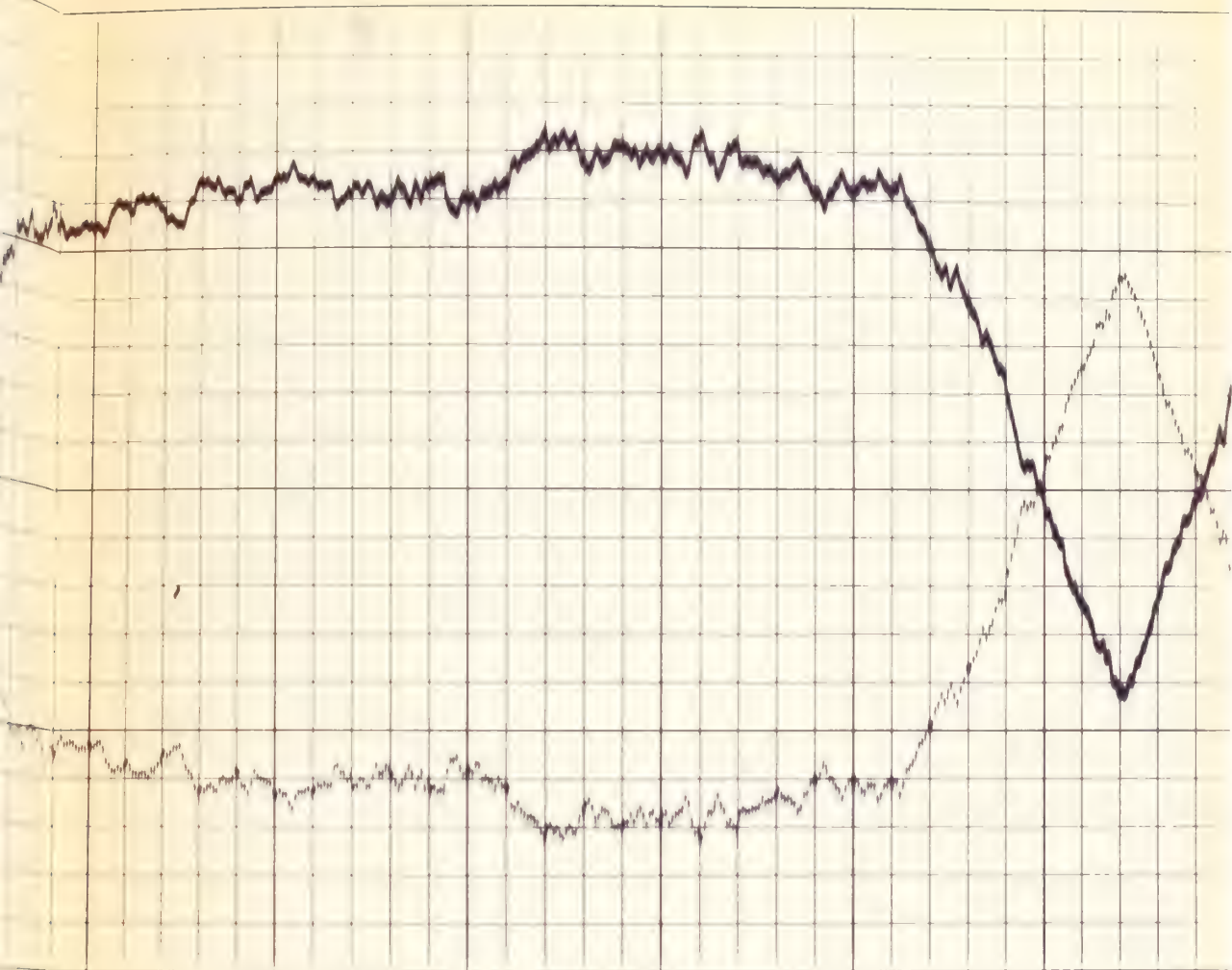


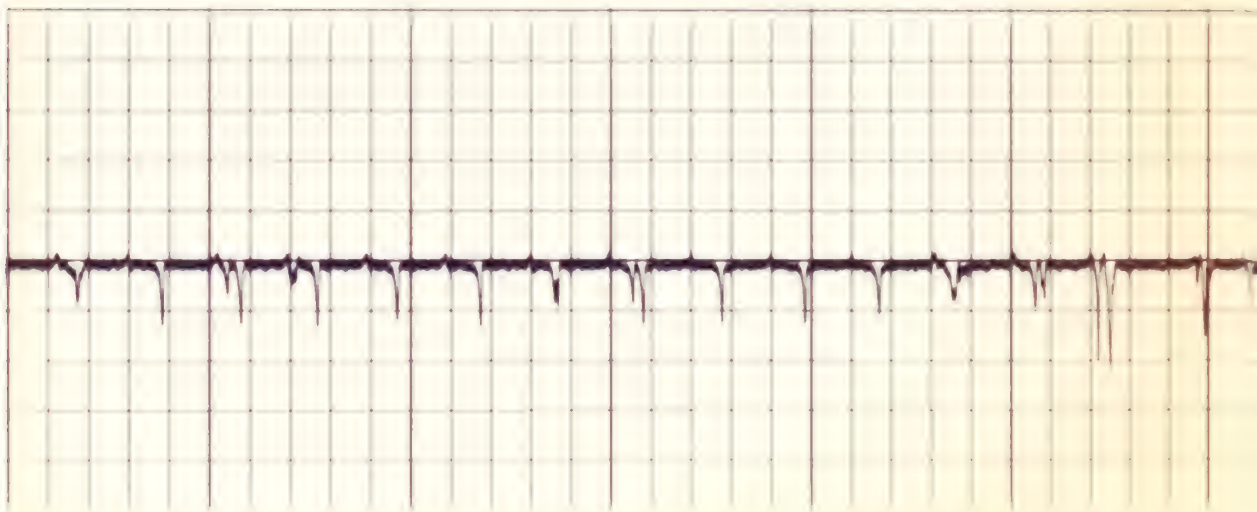
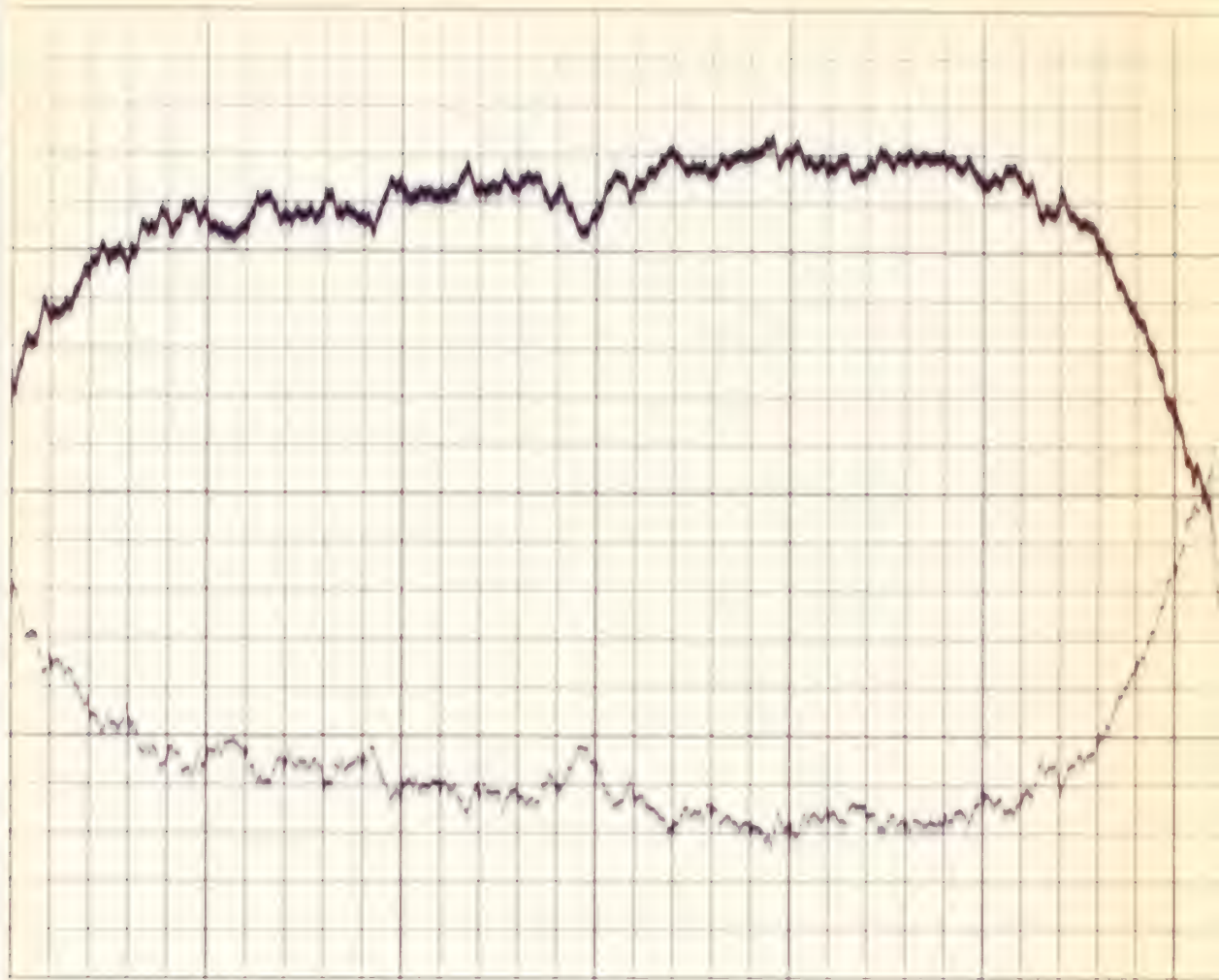


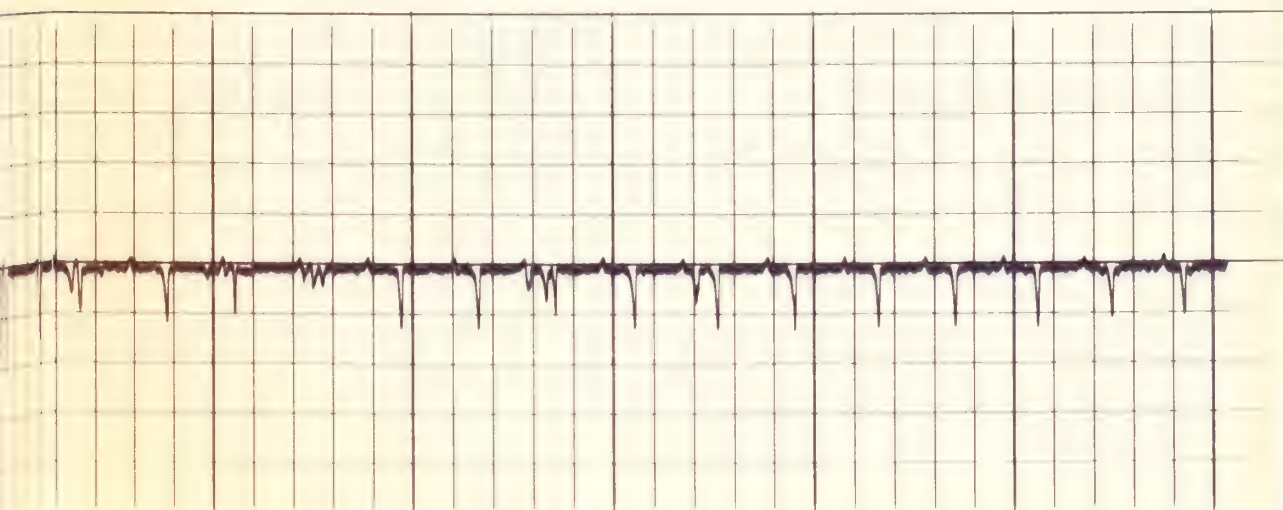
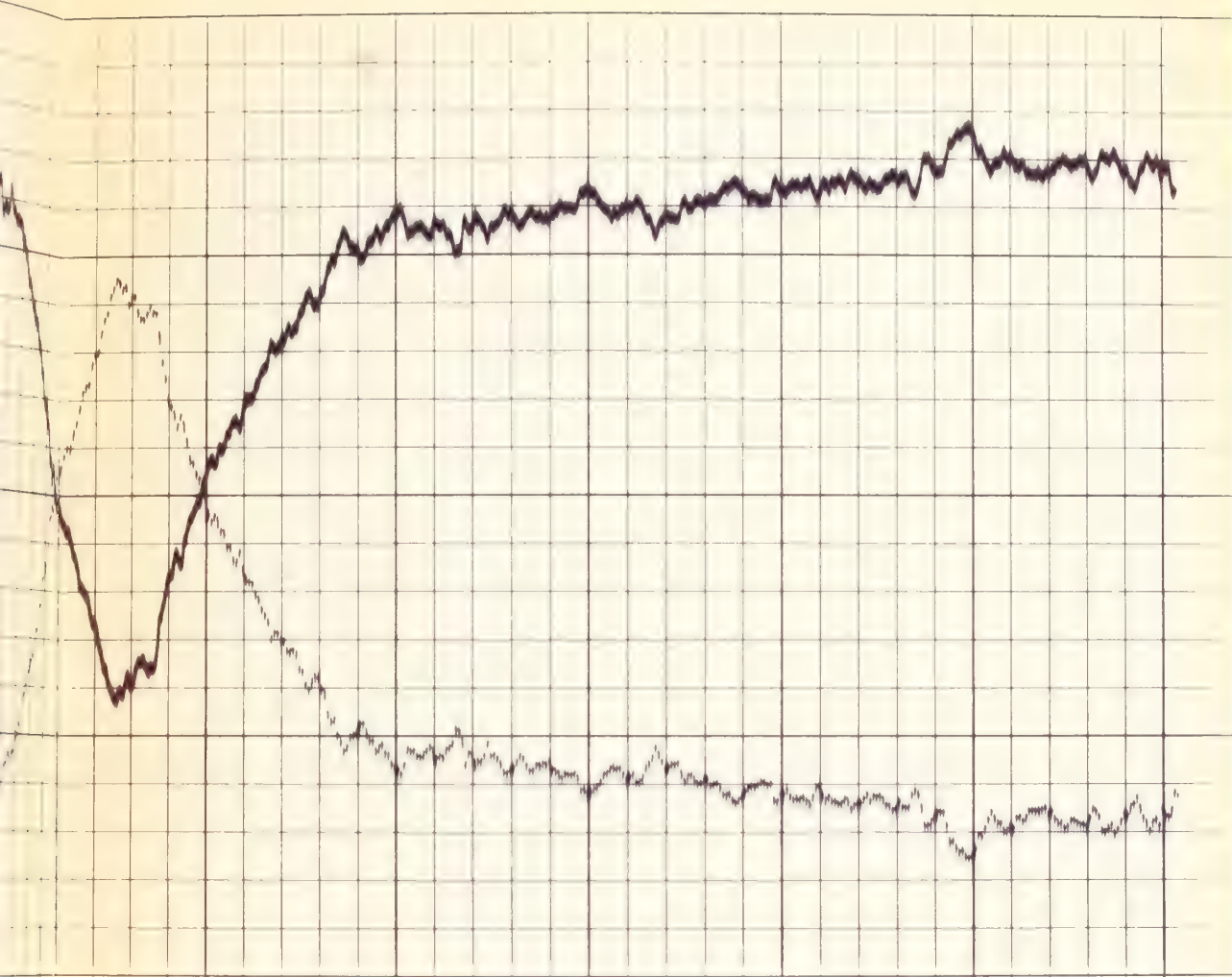
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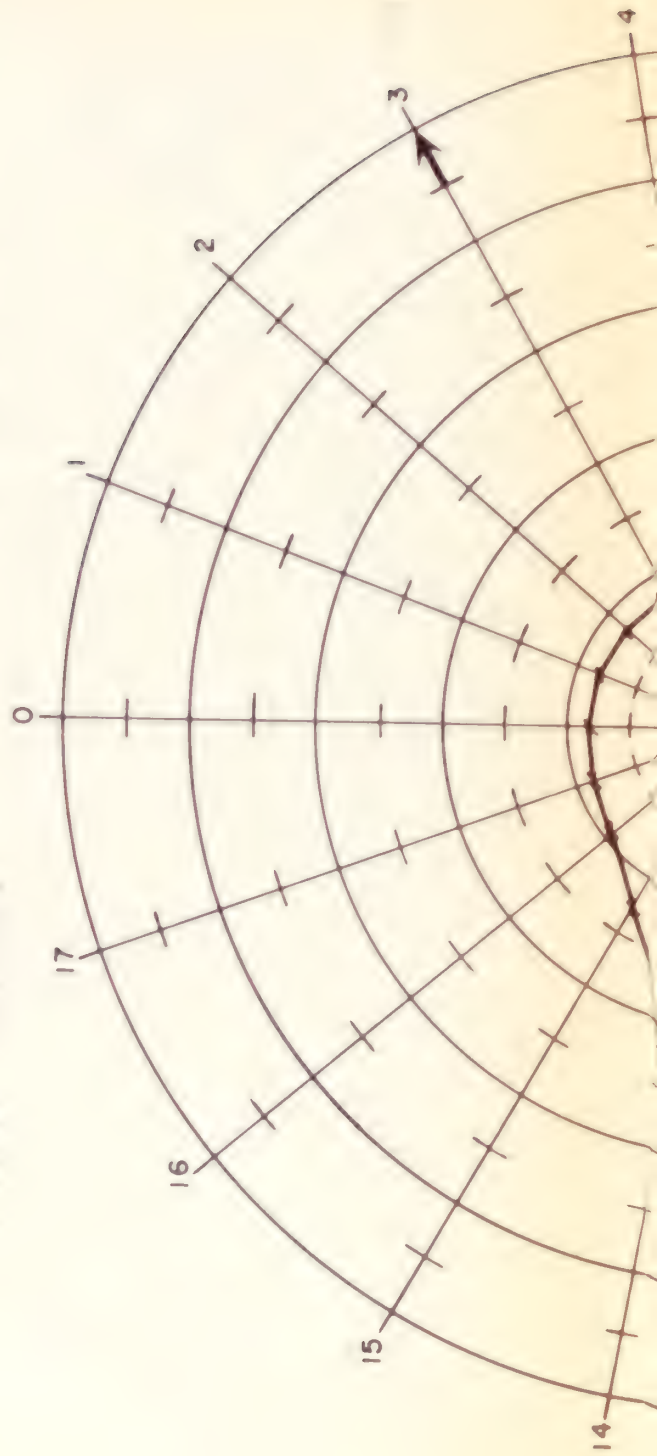


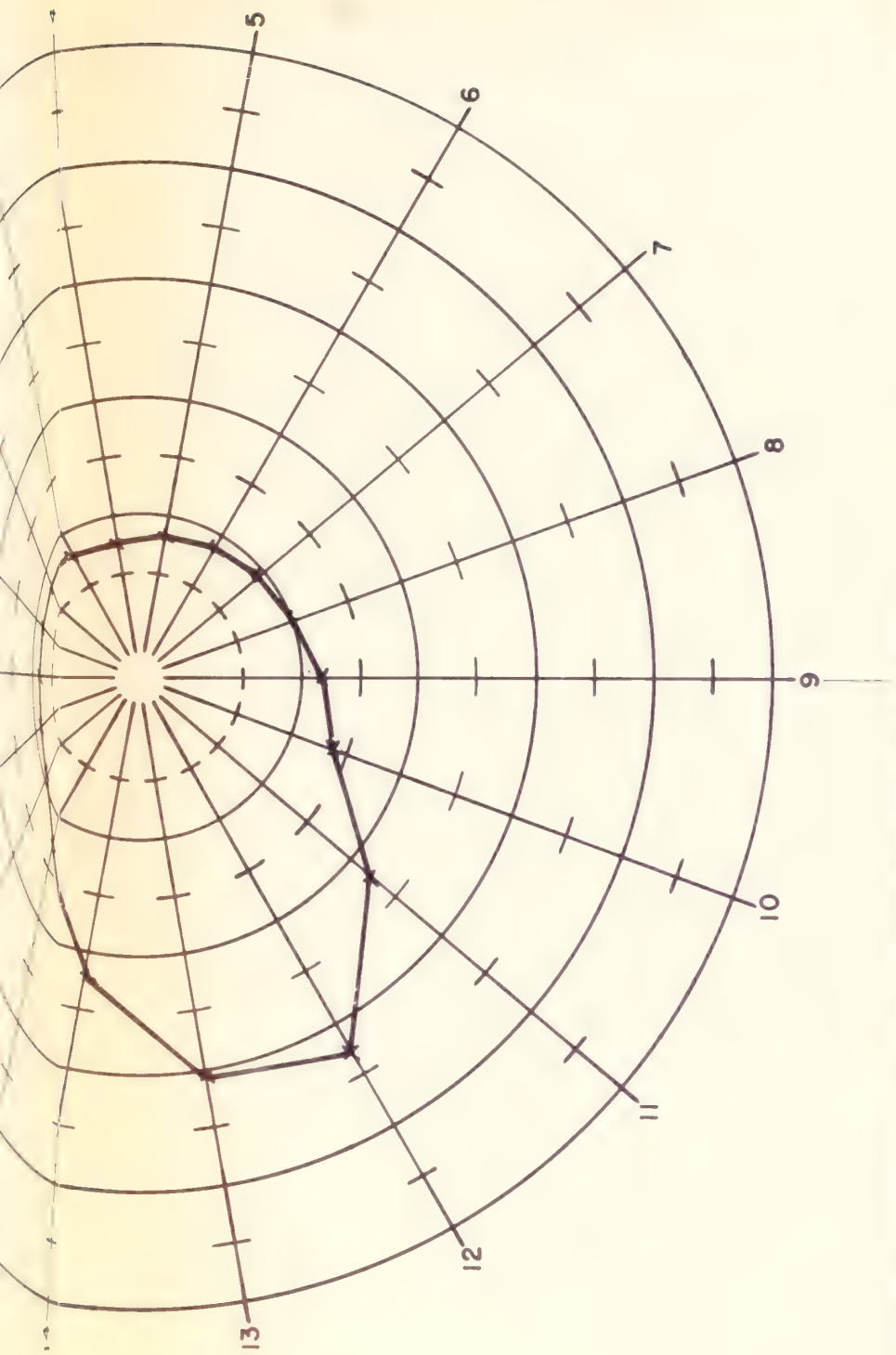






RADIOORIENTATION PLOT POT-B



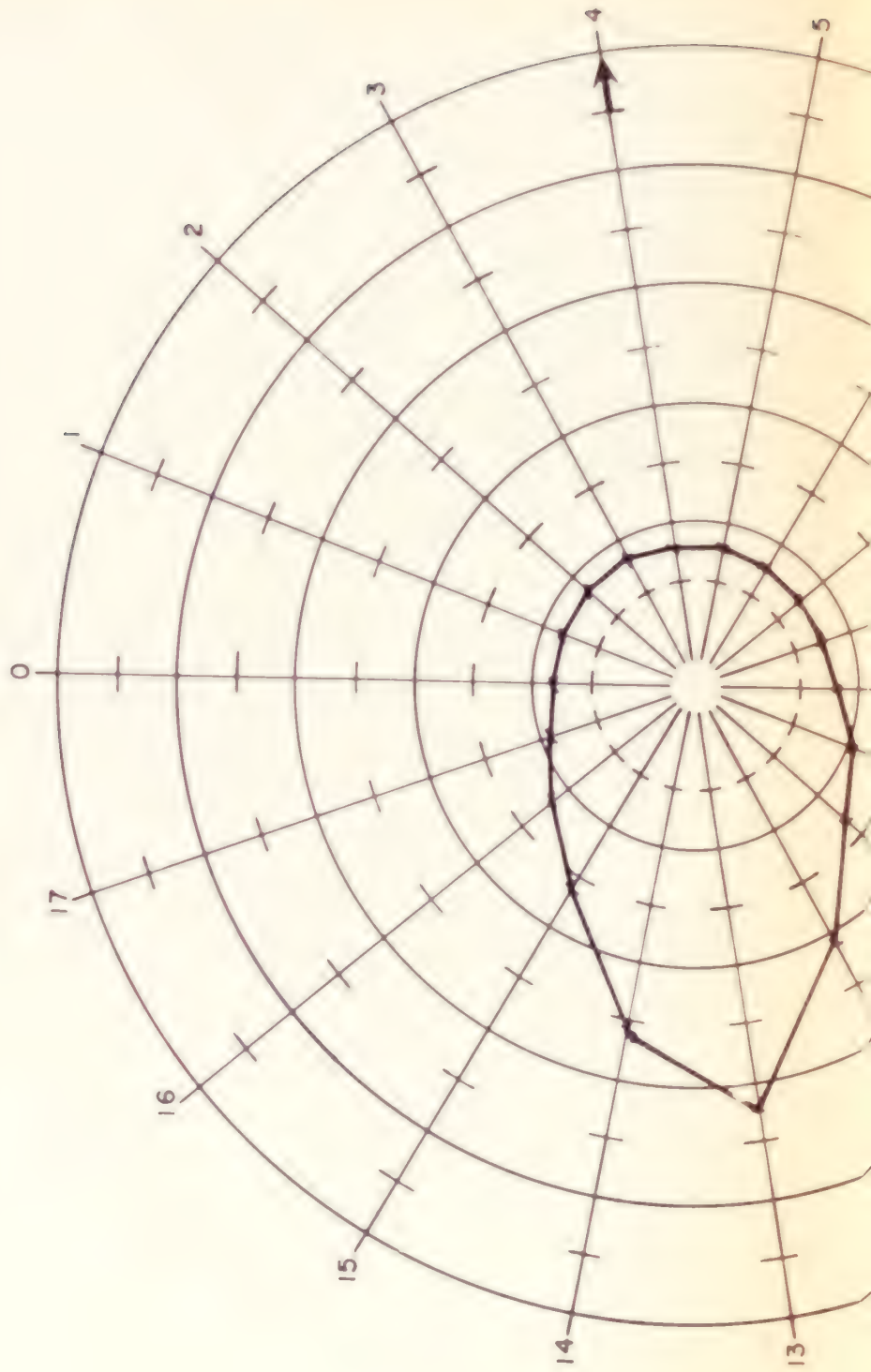


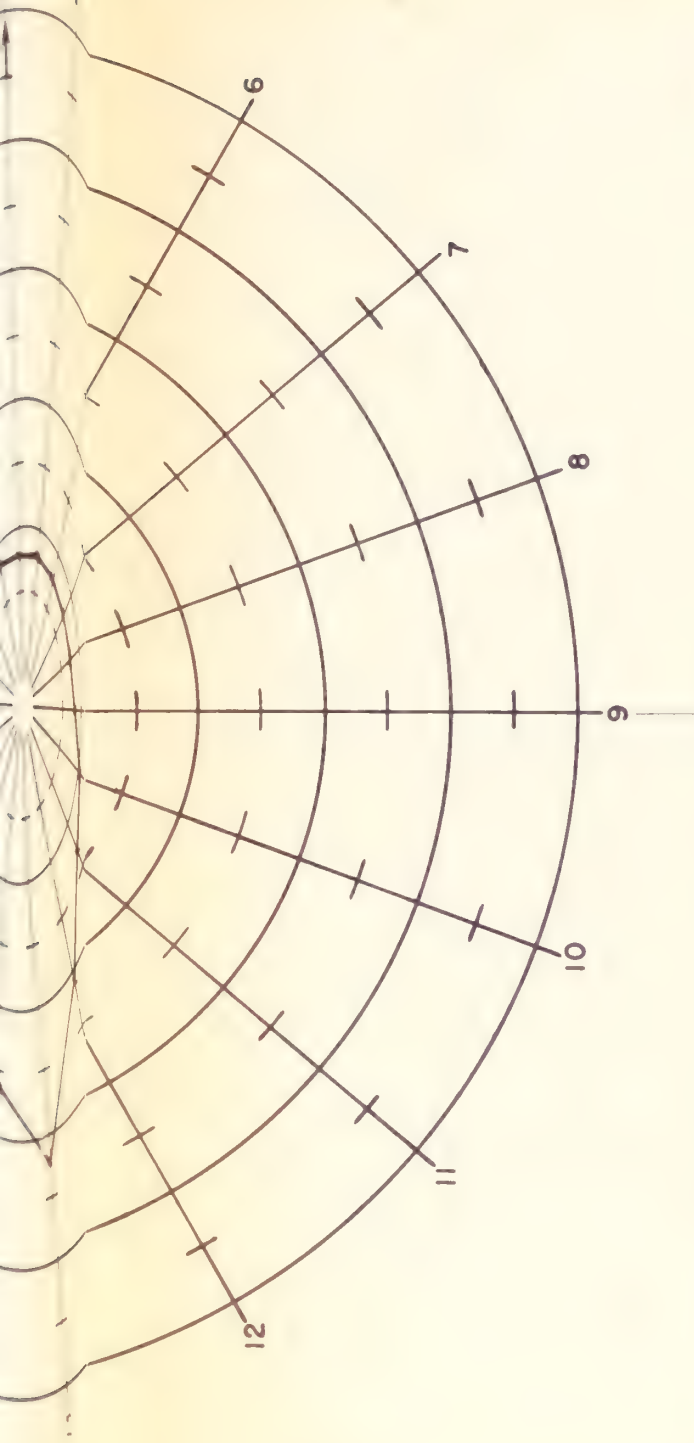
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIORIENTATION PLOT

POT-B

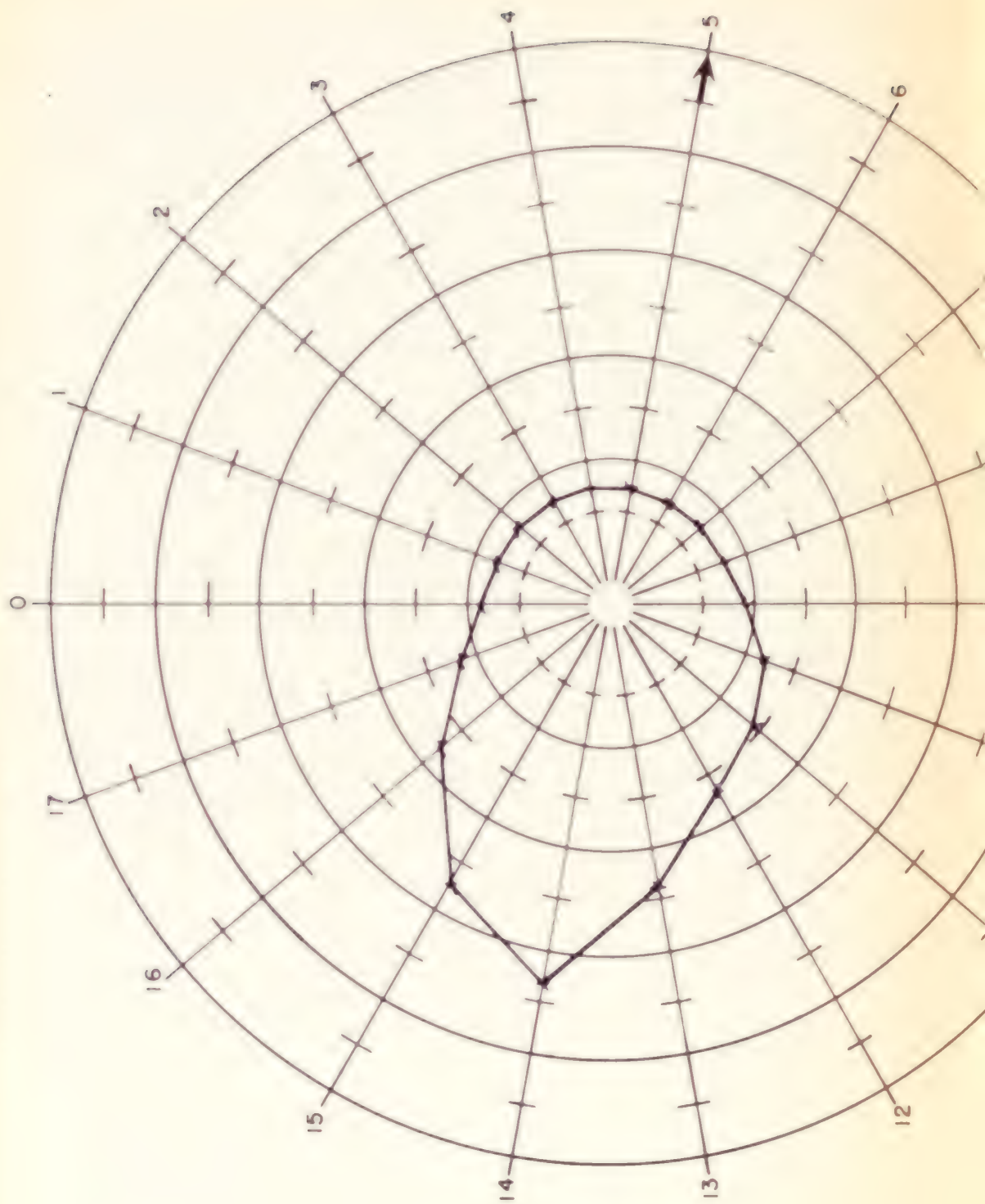


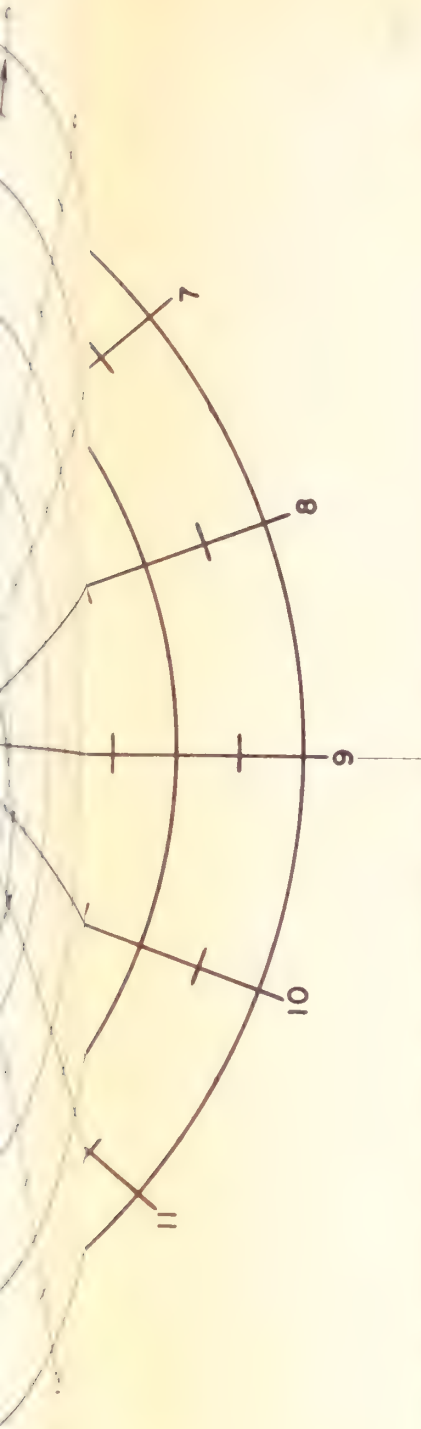


This chart, computation and/or interpretation of our readings from our gamma gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by variant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIOORIENTATION PLOT POT-B

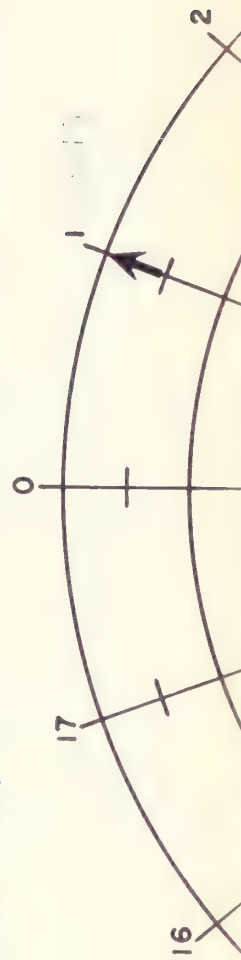


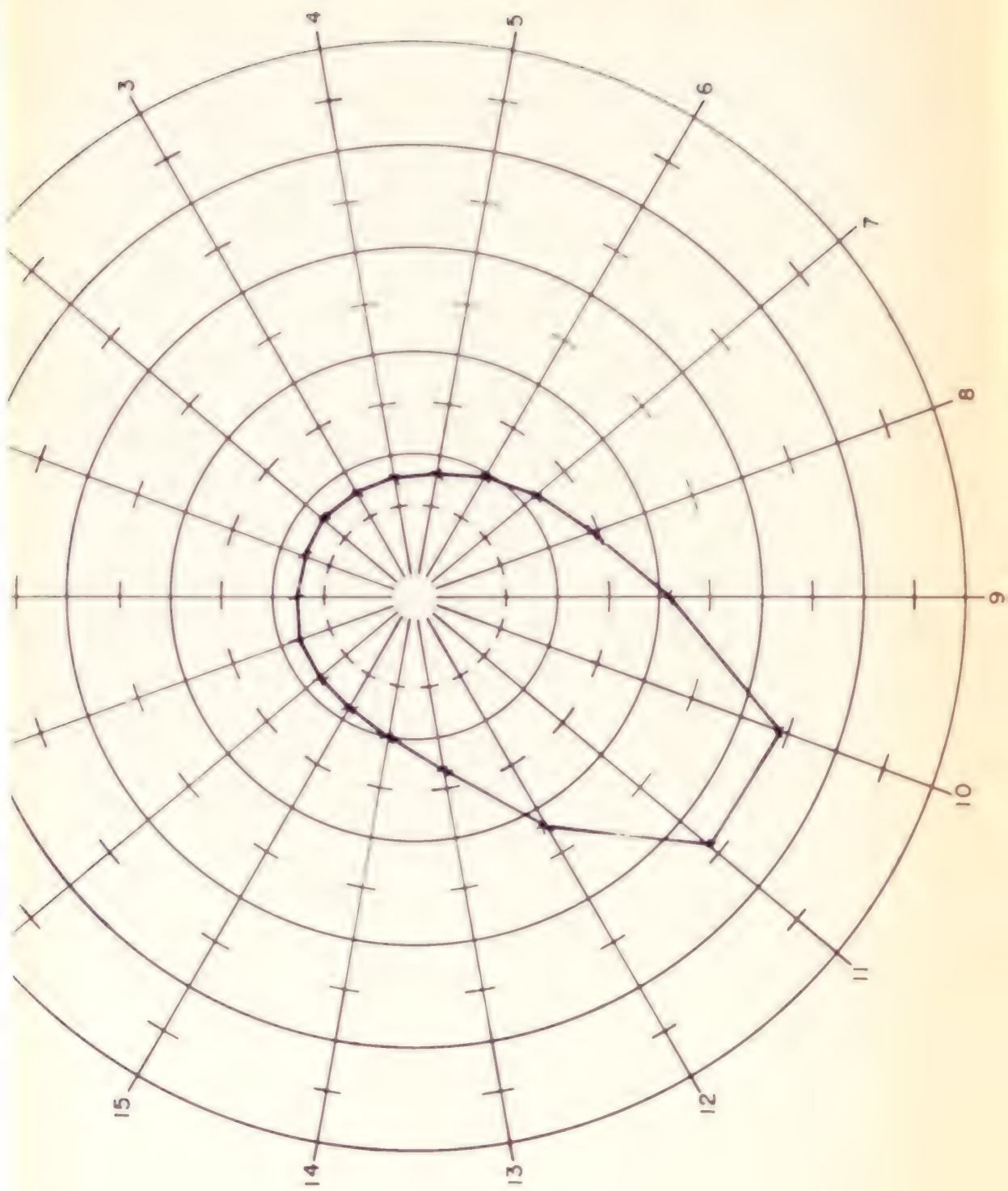


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Schlumberger

RADIORIENTATION PLOT POT-B

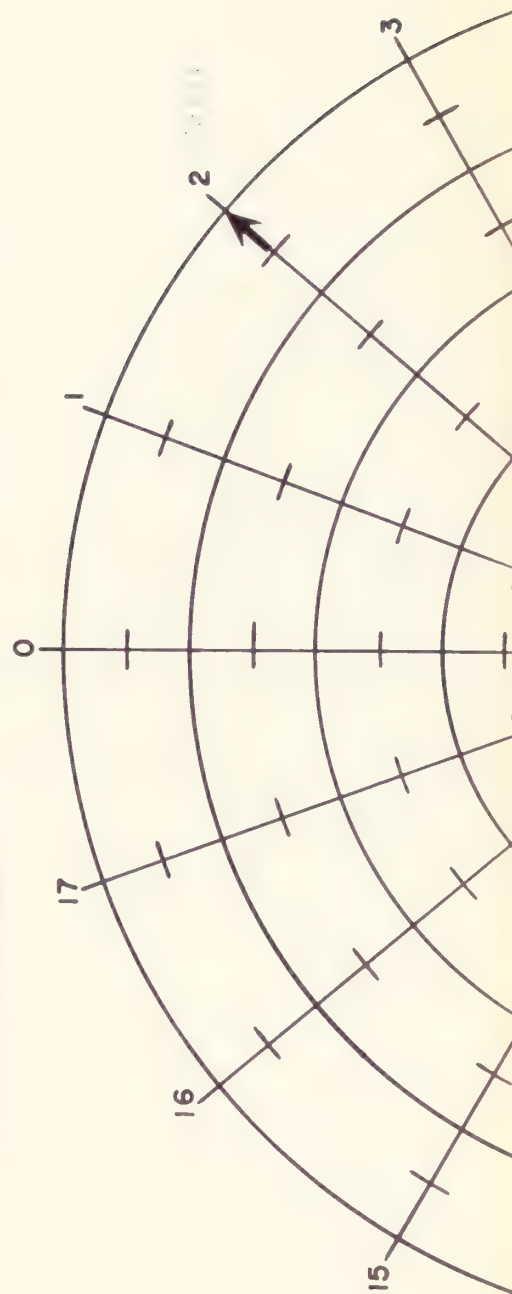


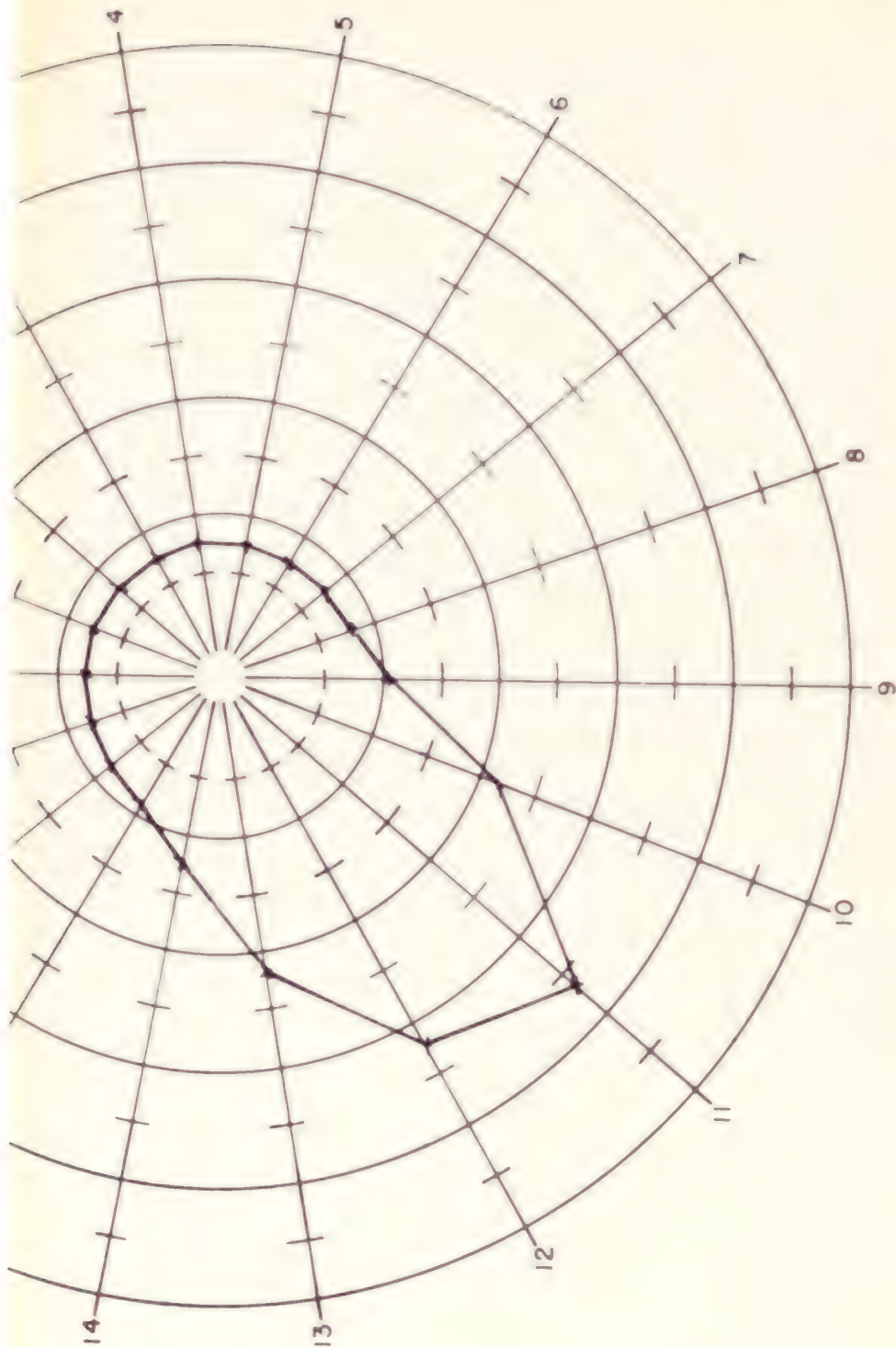


This chart, computation and or interpretation of our readings from our gamma gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by variant metal in the drill hole and other conditions unknown to us.

Schlumberger

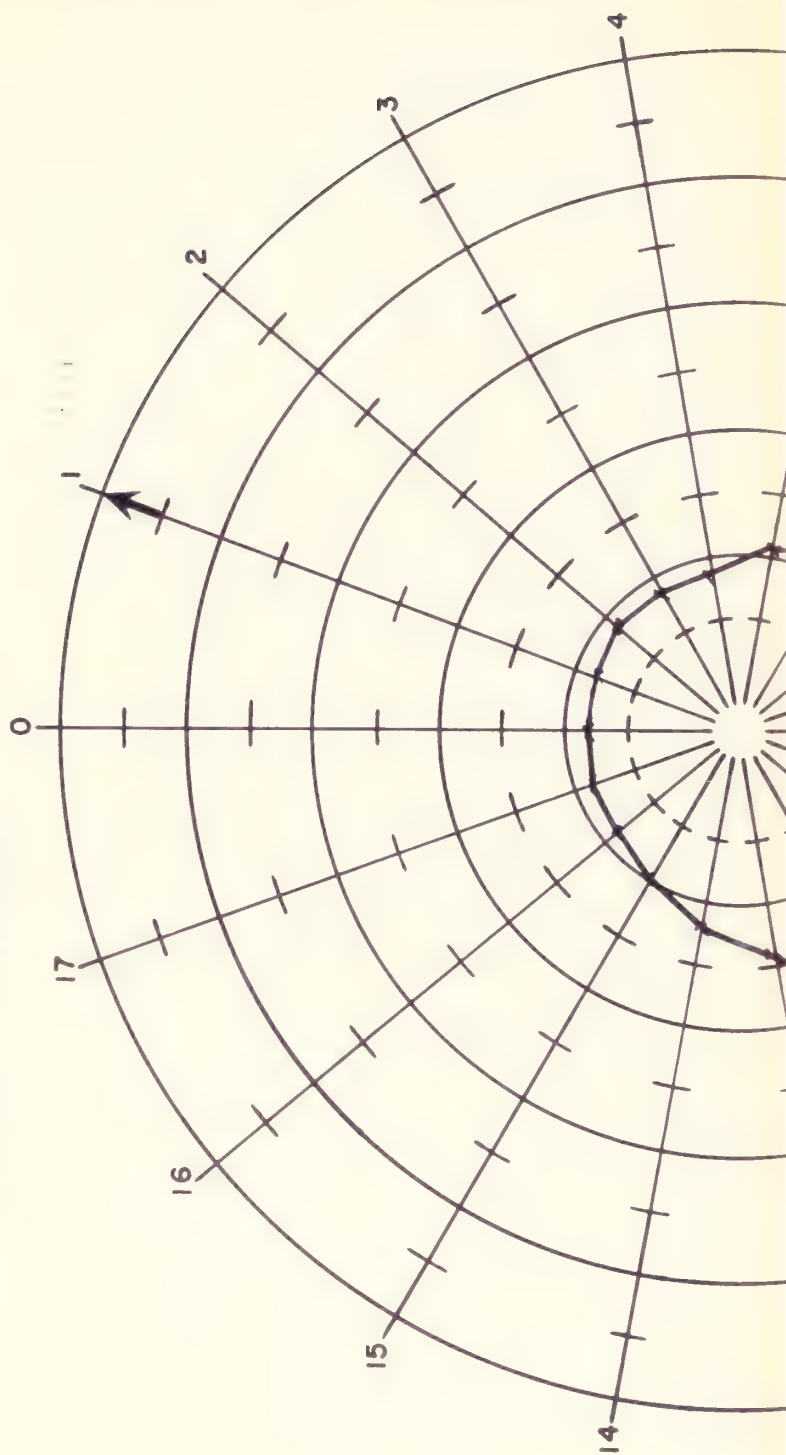
RADIO-ORIENTATION PLOT POT-B

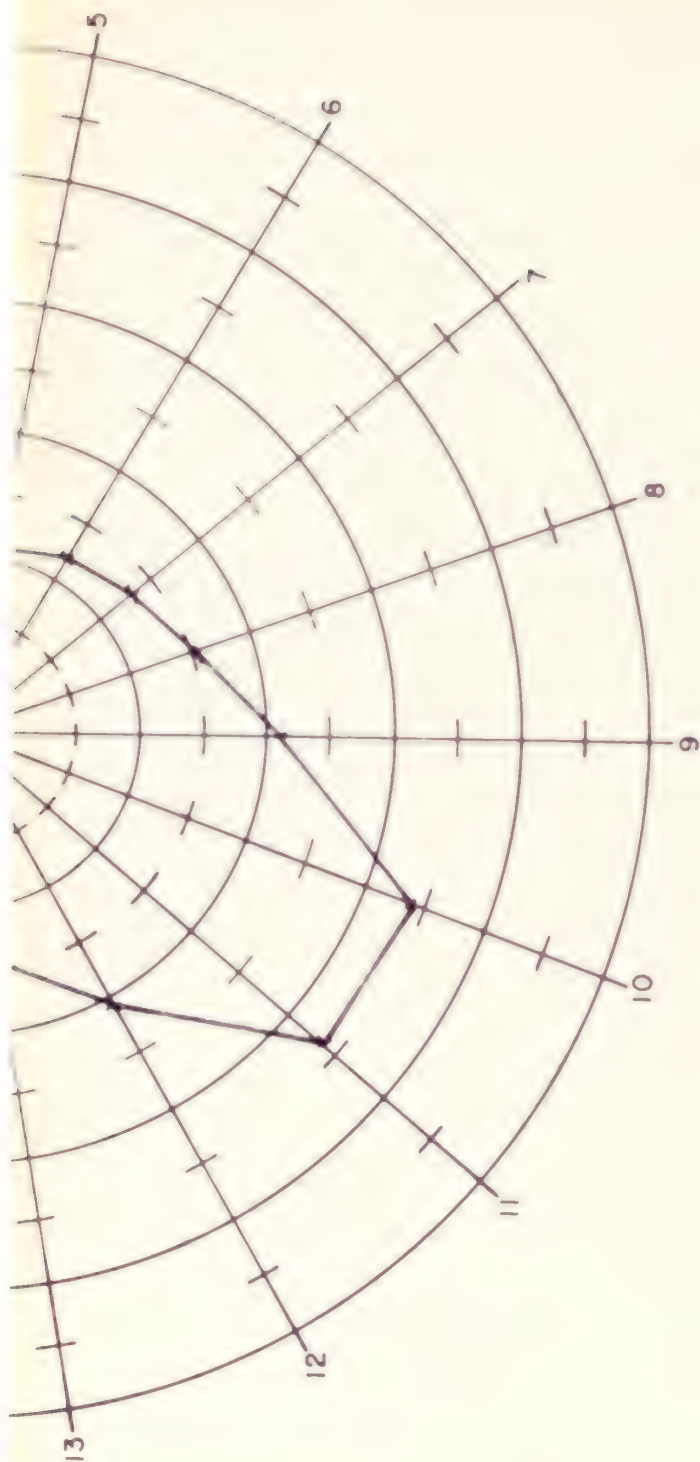




This chart, constructed and on logarithmic and semi-logarithmic scales, is used for plotting resistivity curves. The resistivity curve is plotted on the radial axis, and the distance or depth is plotted on the concentric arcs. The curve is plotted by connecting points marked by dots. The curve shows a peak around the 10 o'clock position and a dip around the 2 o'clock position.

RADIORIENTATION PLOT POT-B

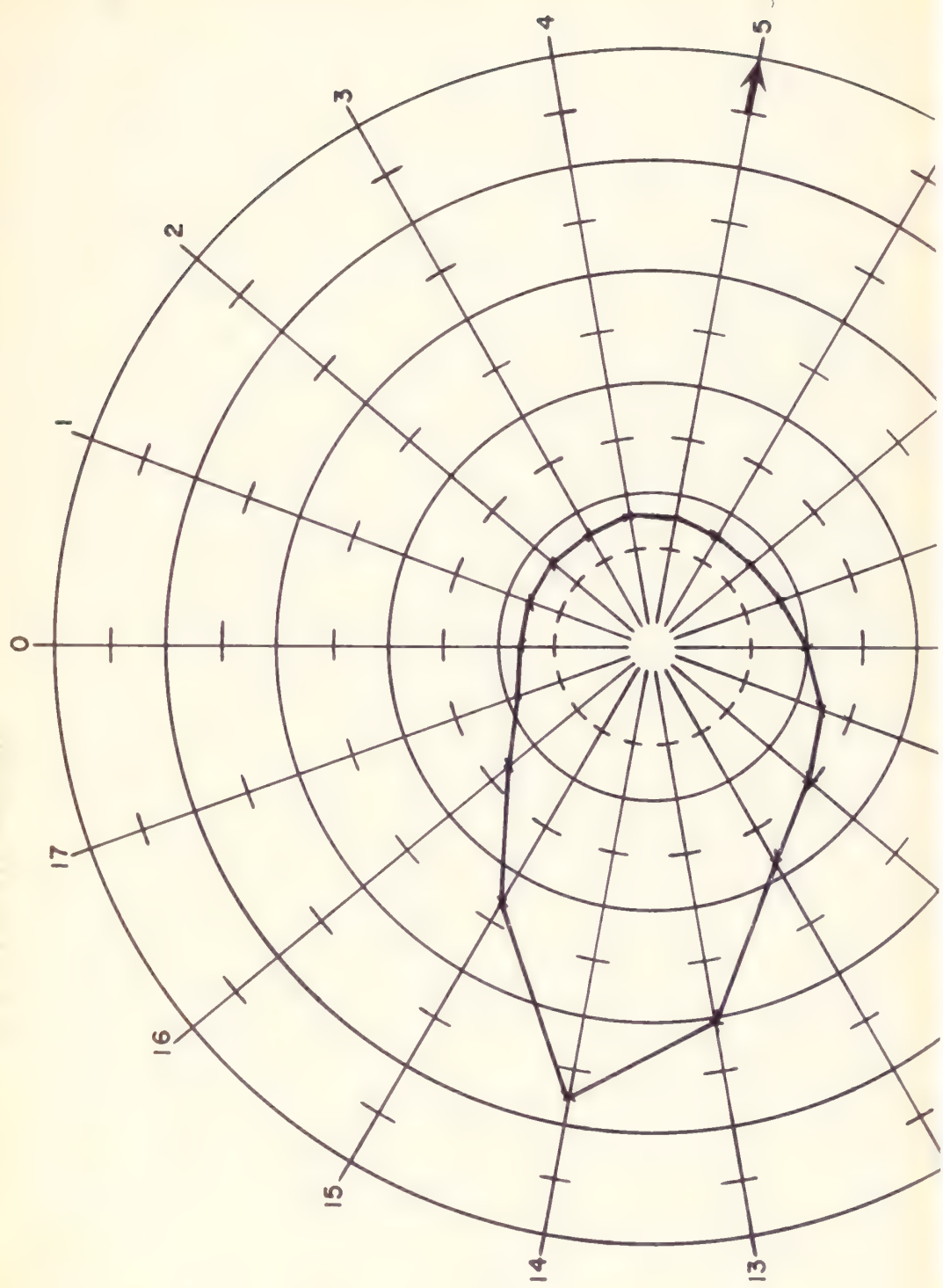


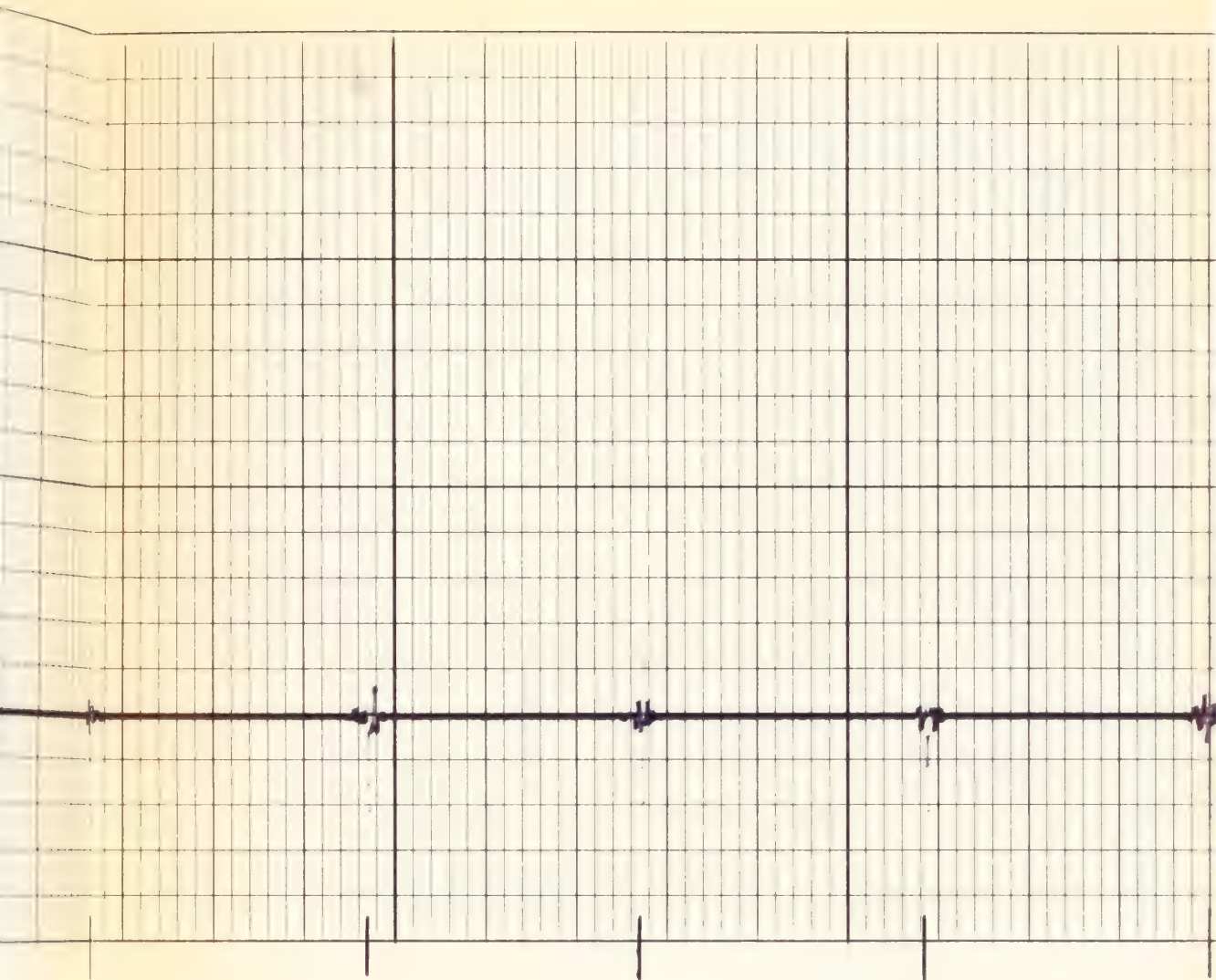


This *charta*, composed as an *exhortatio* to the king, is written in a cursive hand of the twelfth century, and contains a list of the names of the king's subjects, who were to be exempted from the payment of the *decima* and *servitia* in return for their services to the king. The names are arranged in three columns, and the list is headed by the name of the king, *Henricus*. The names are written in a cursive hand, and the list is written in a cursive hand.

Schlumberger

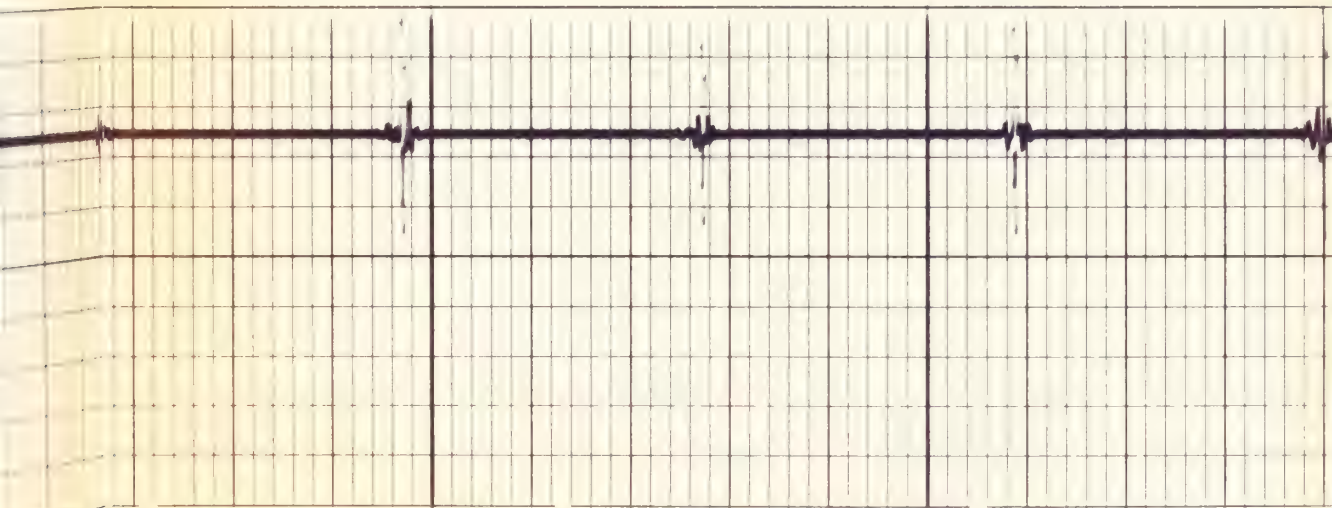
RADIORIENTATION PLOT POT-B

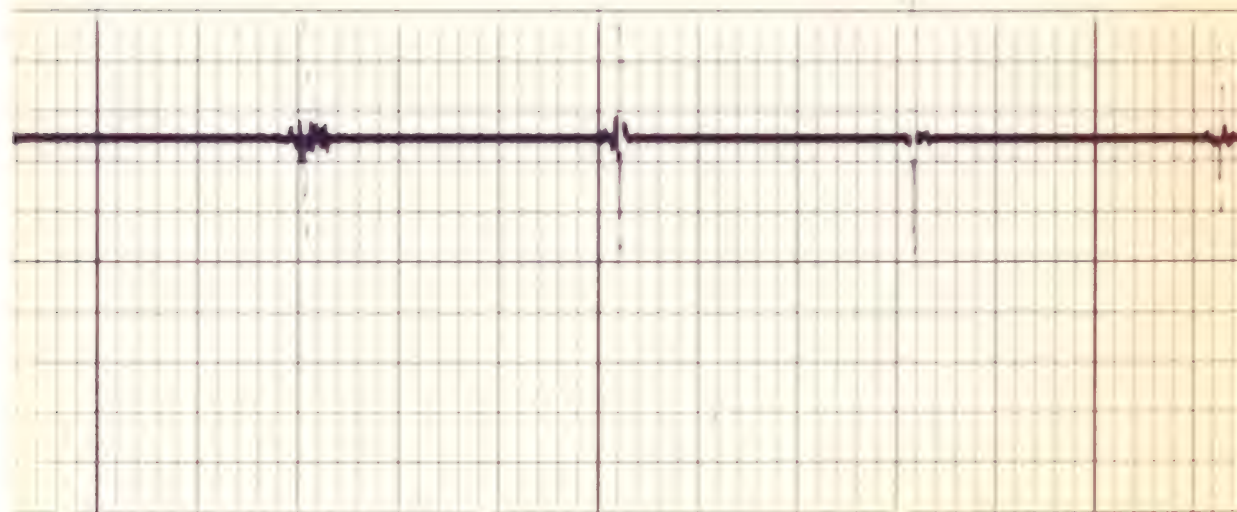
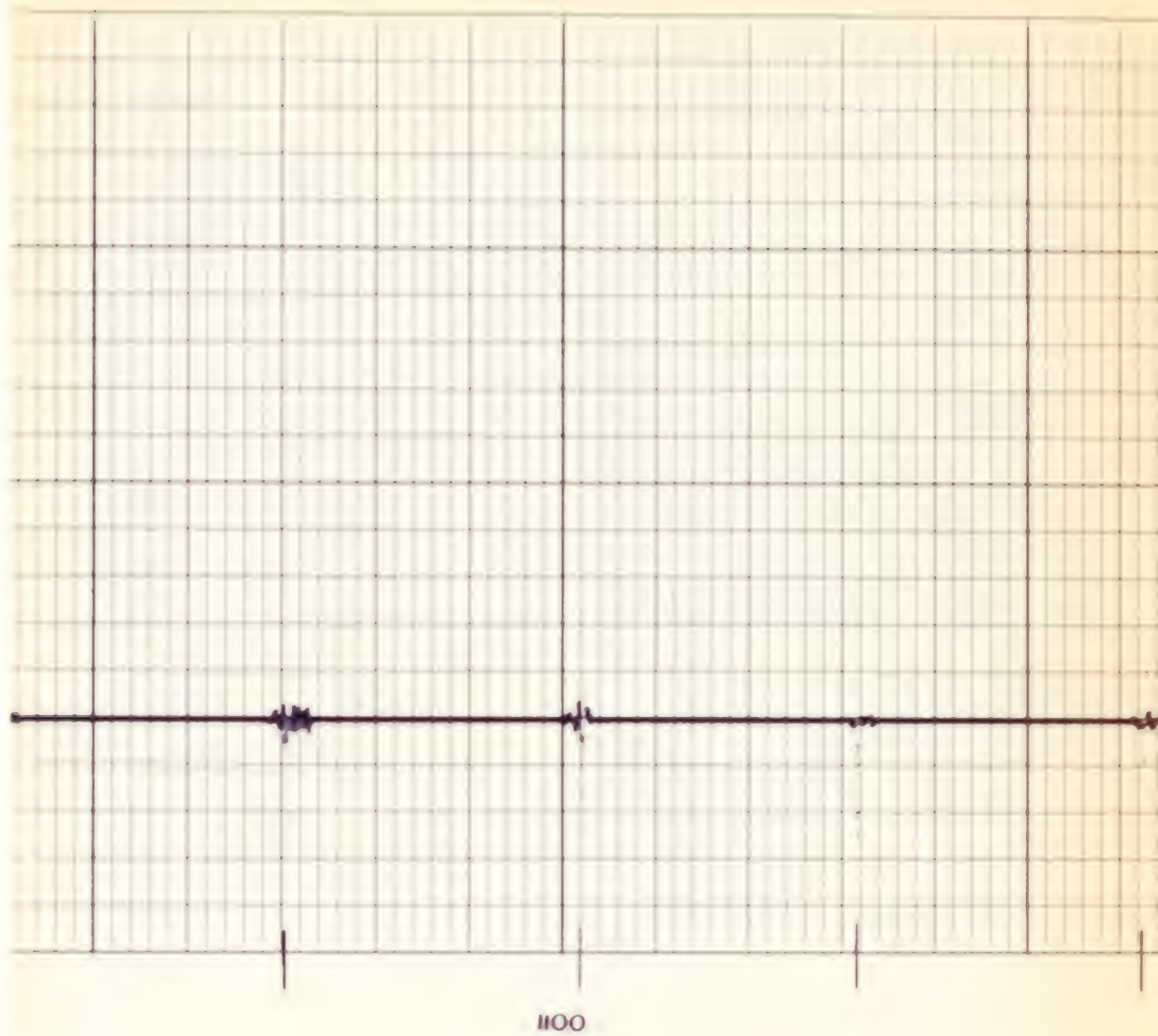


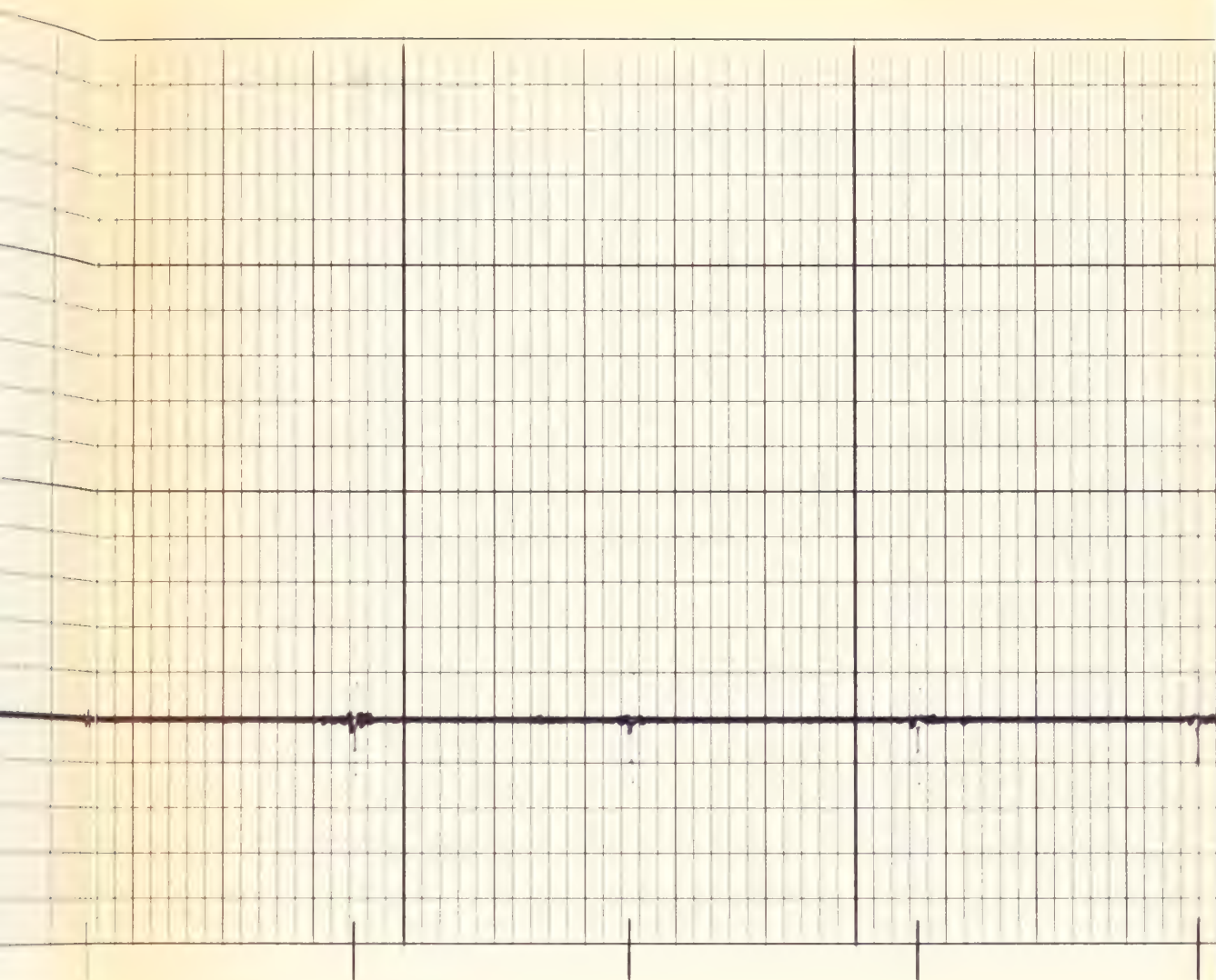


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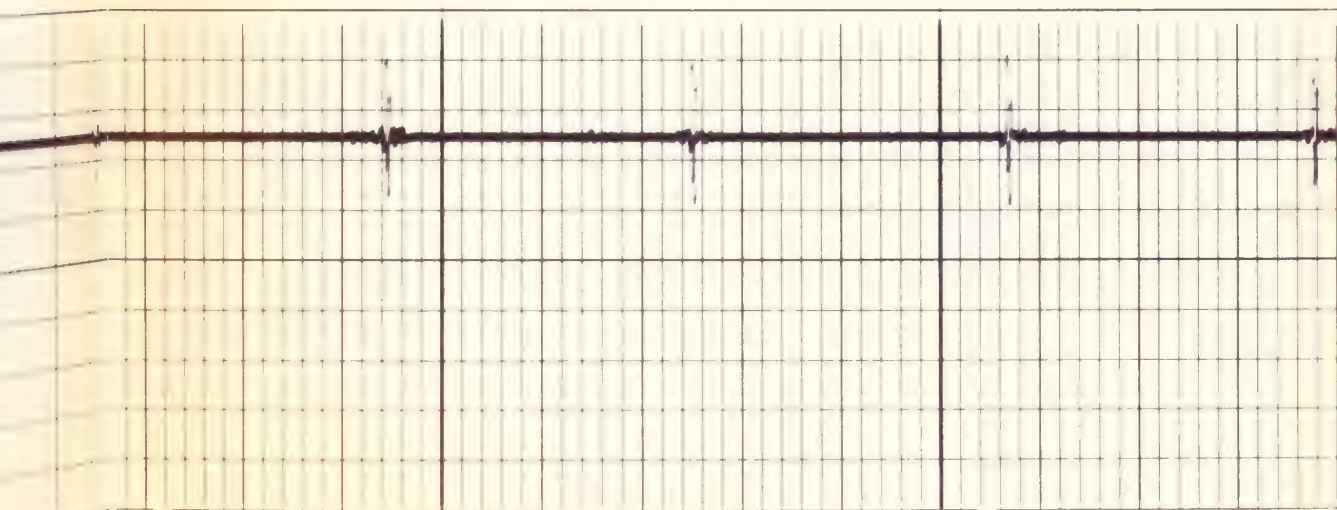
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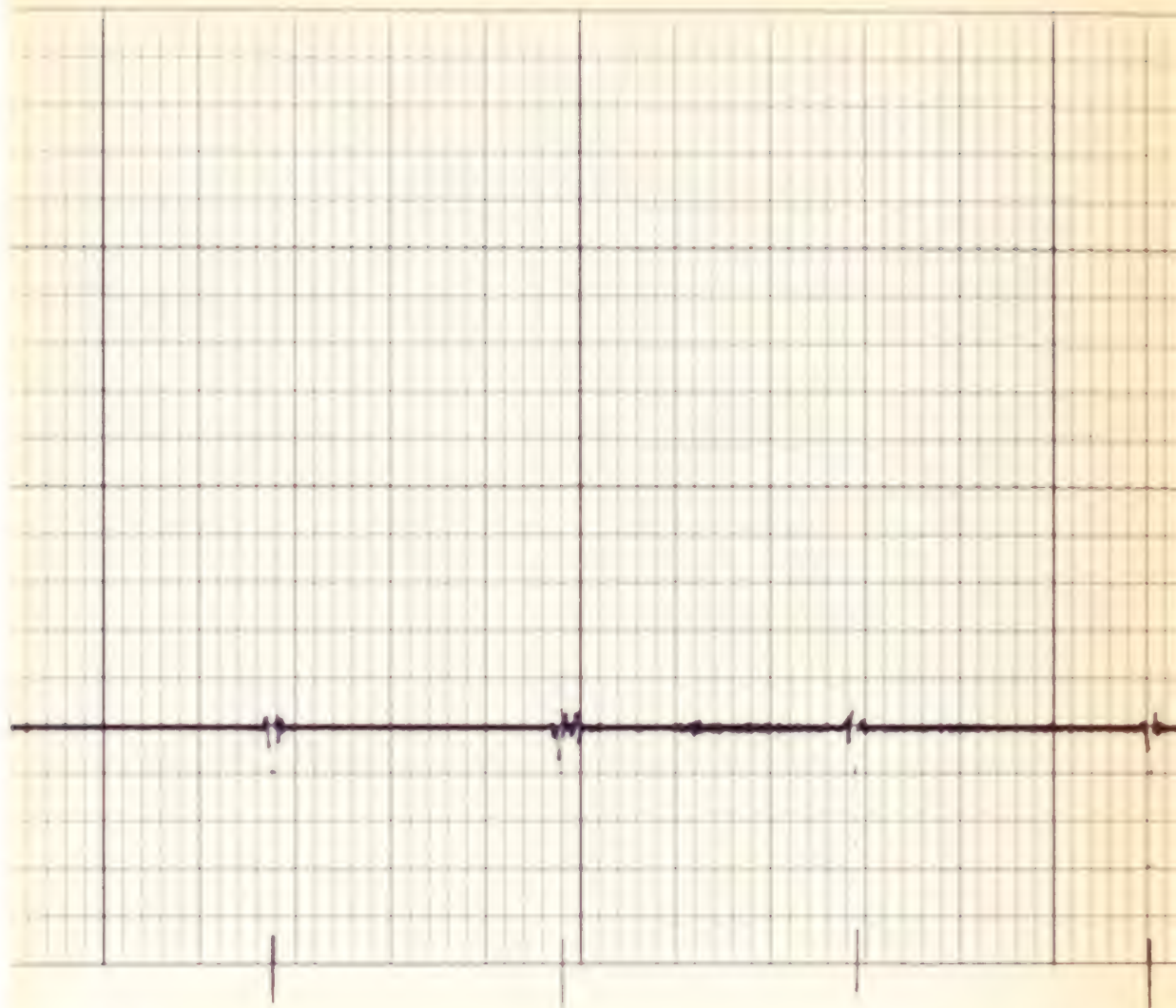






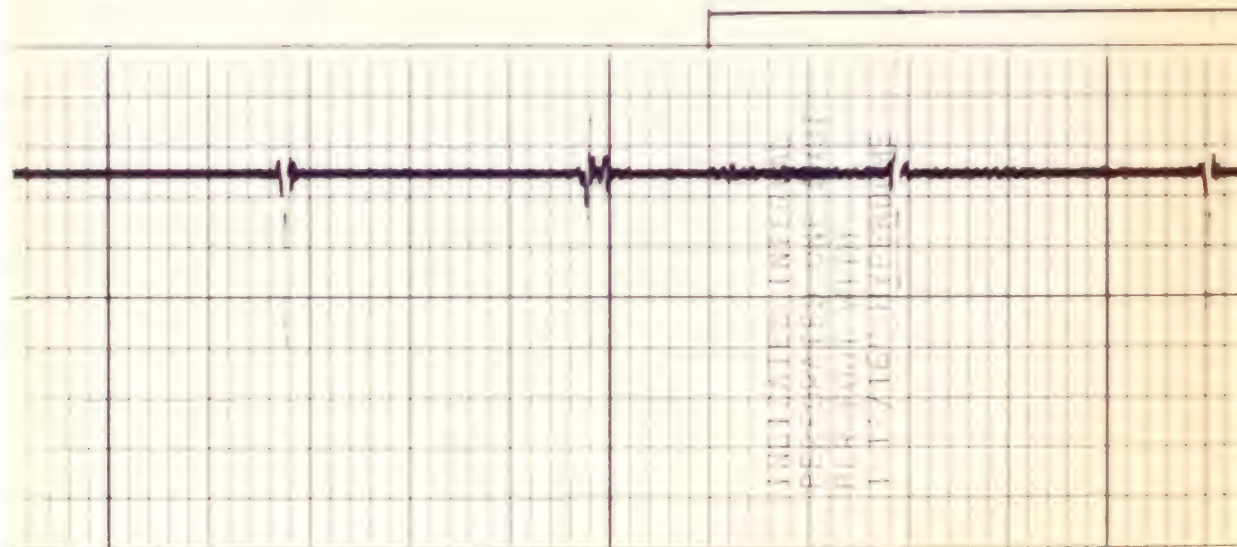
1200



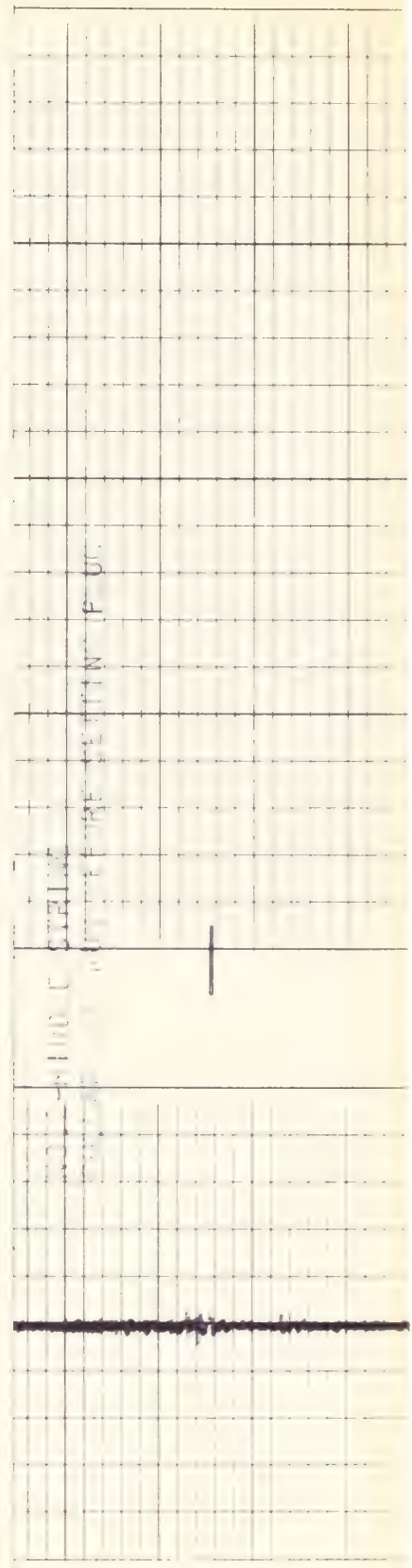
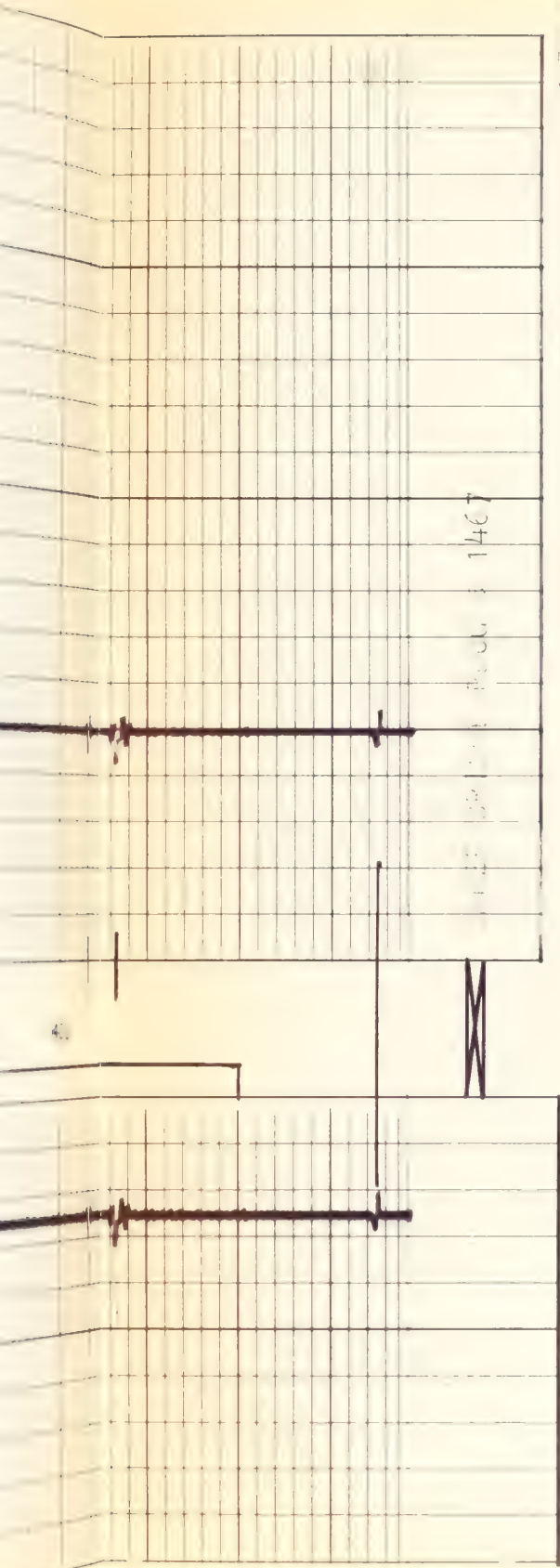


1300

1400



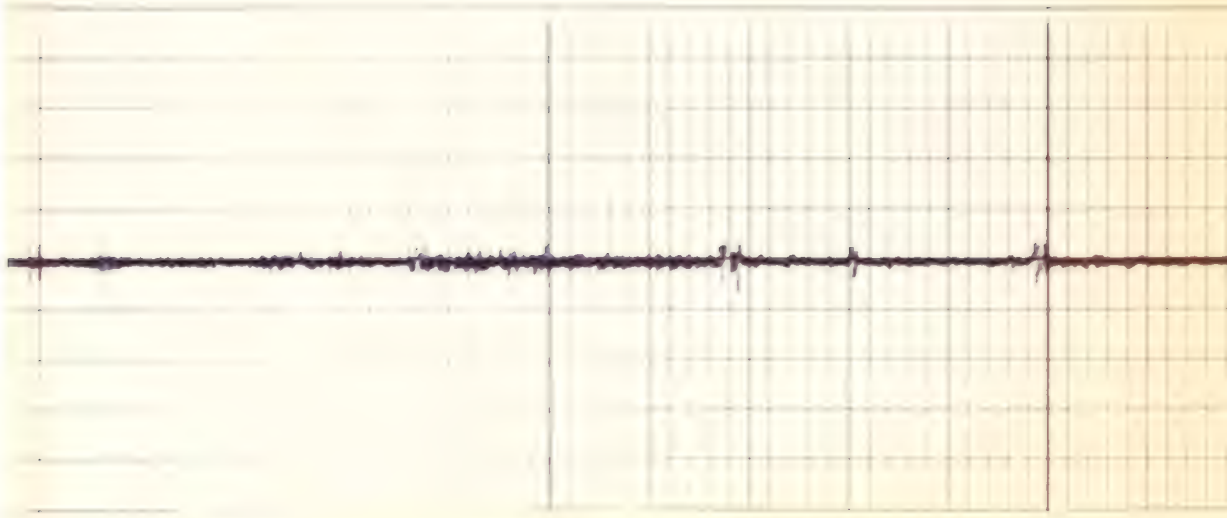
INTERMITTENT
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1.1/16" (2.5mm)
1.1/16" (2.5mm)

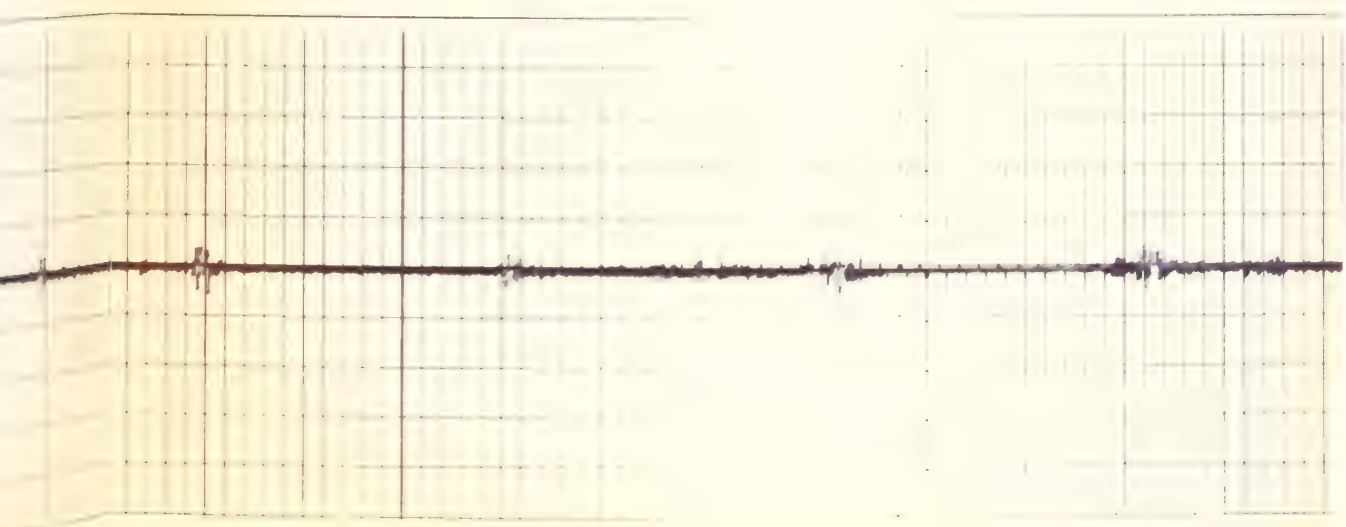
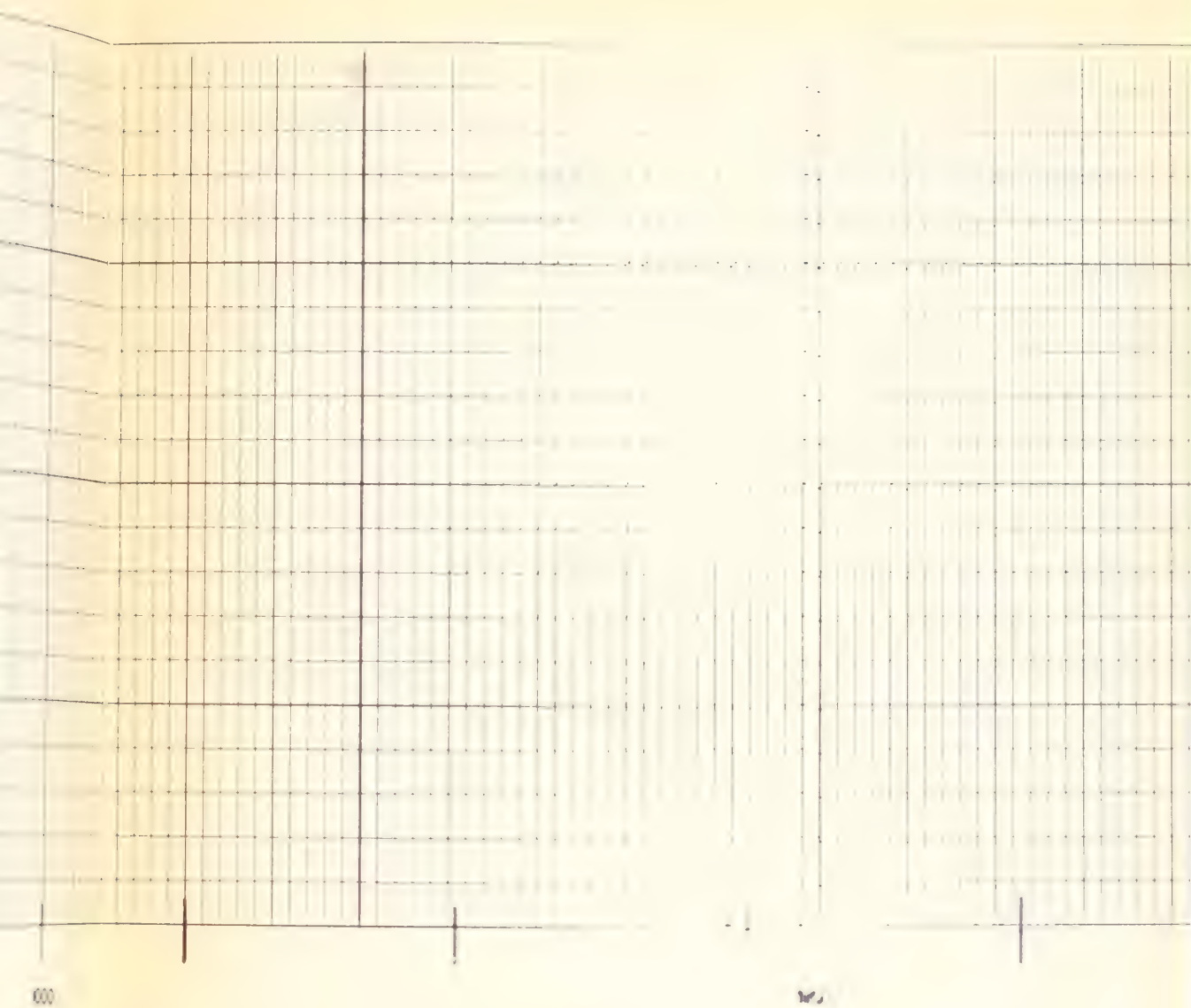


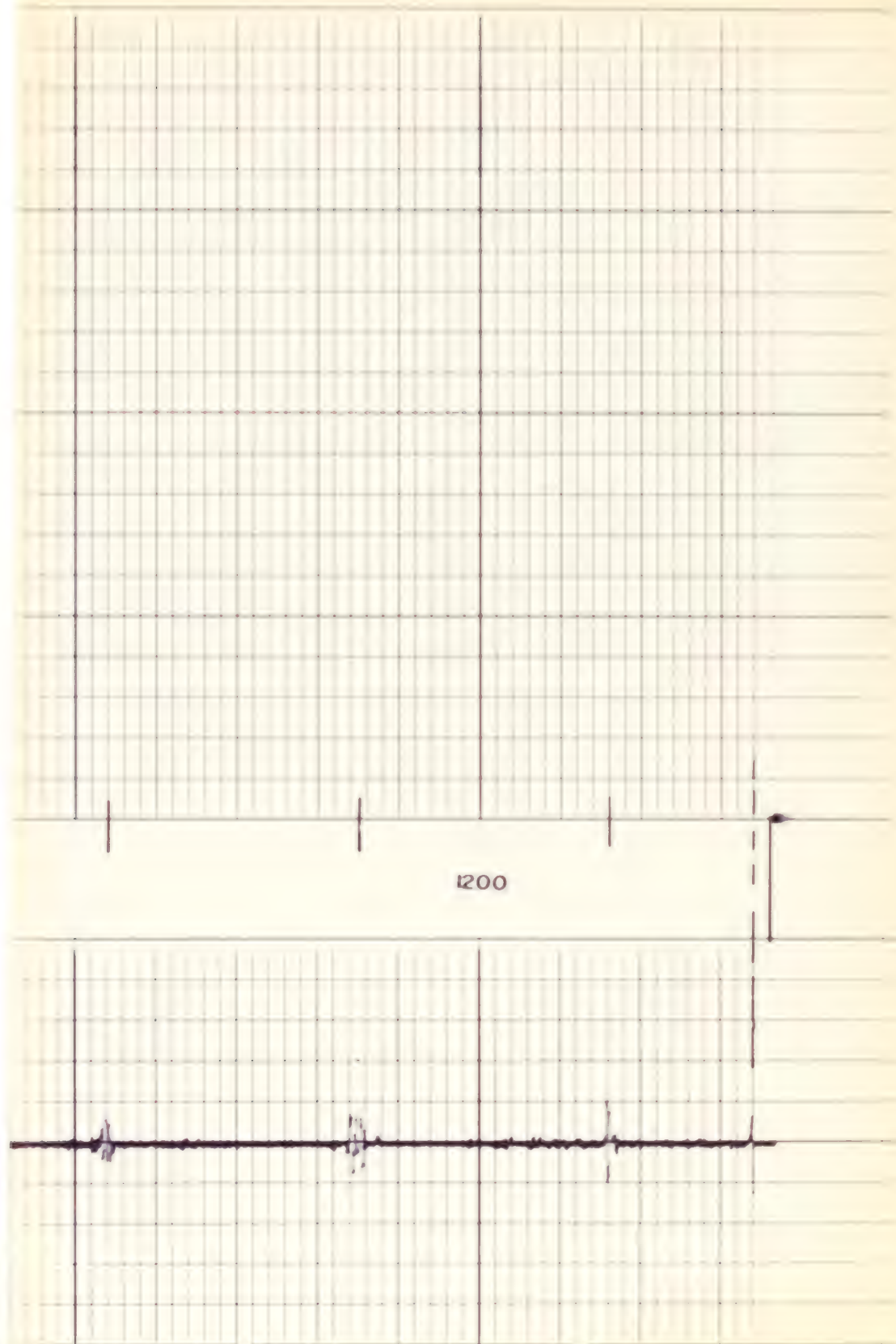


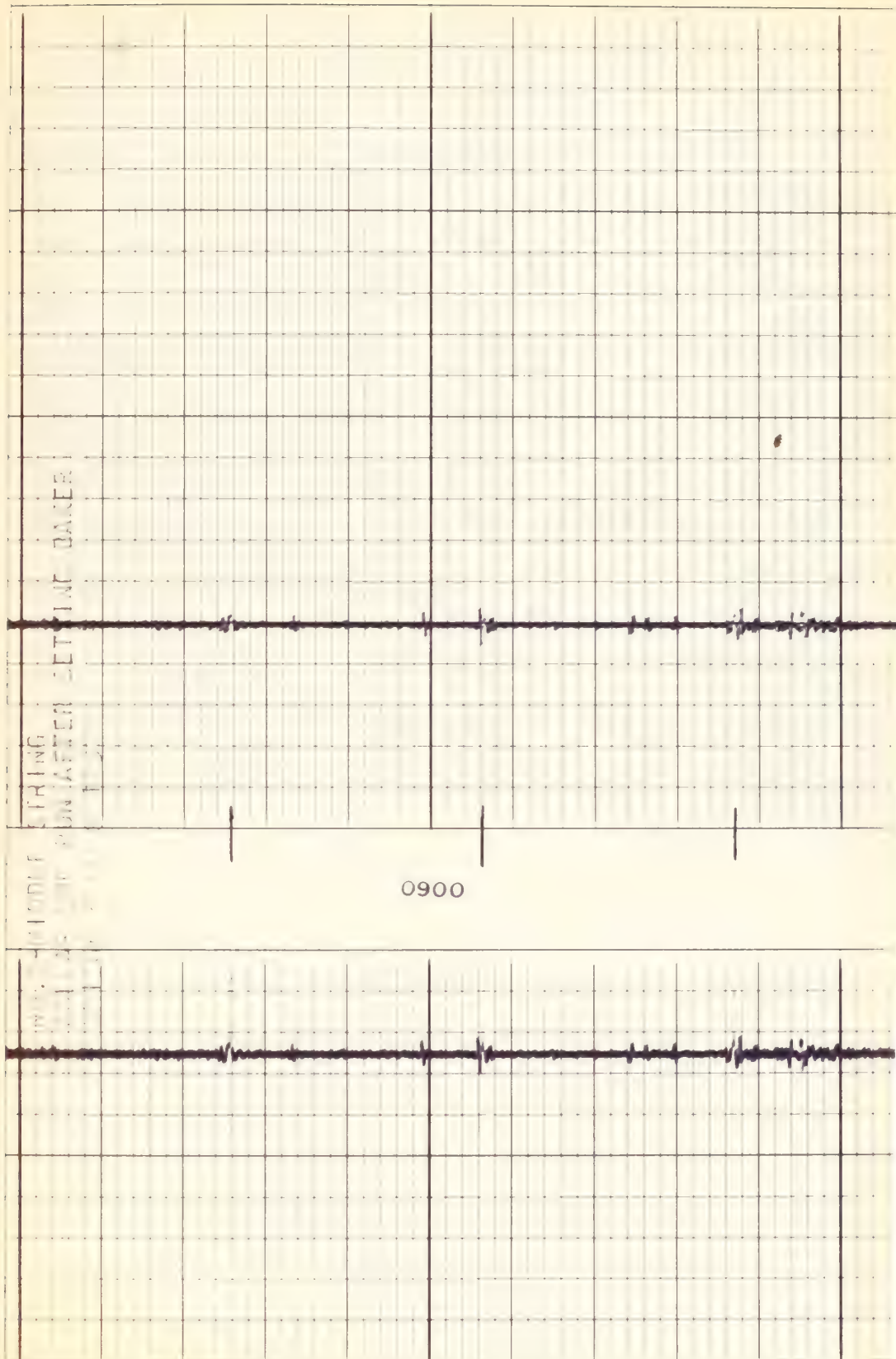
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1000



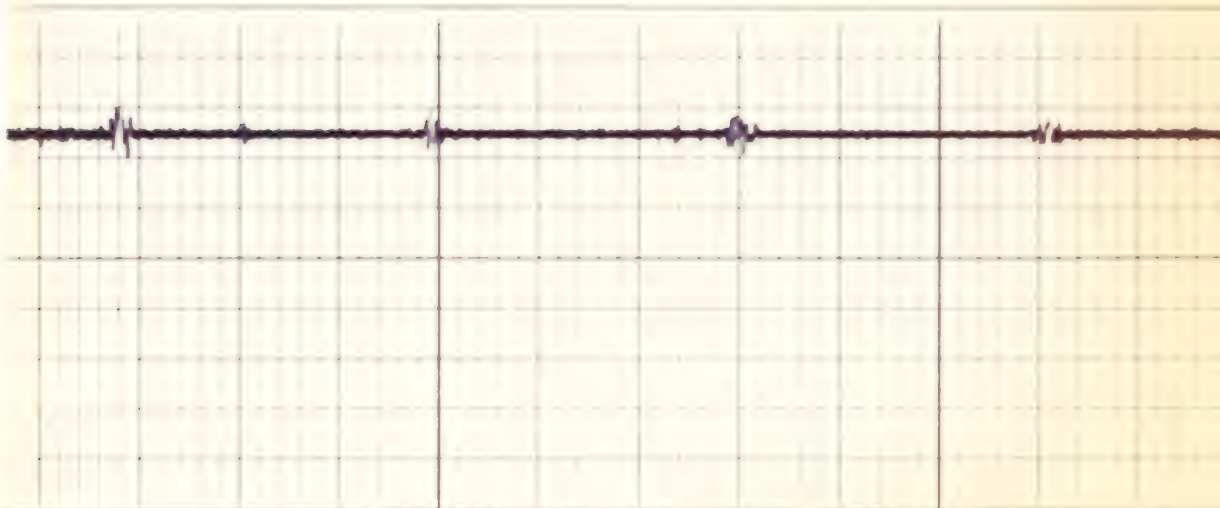


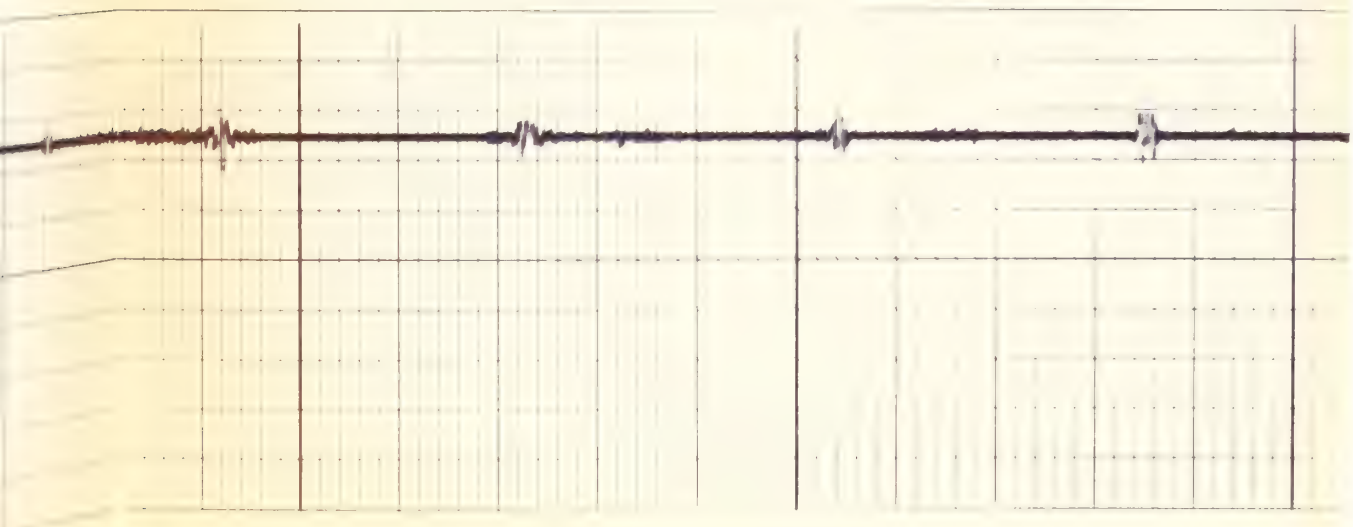
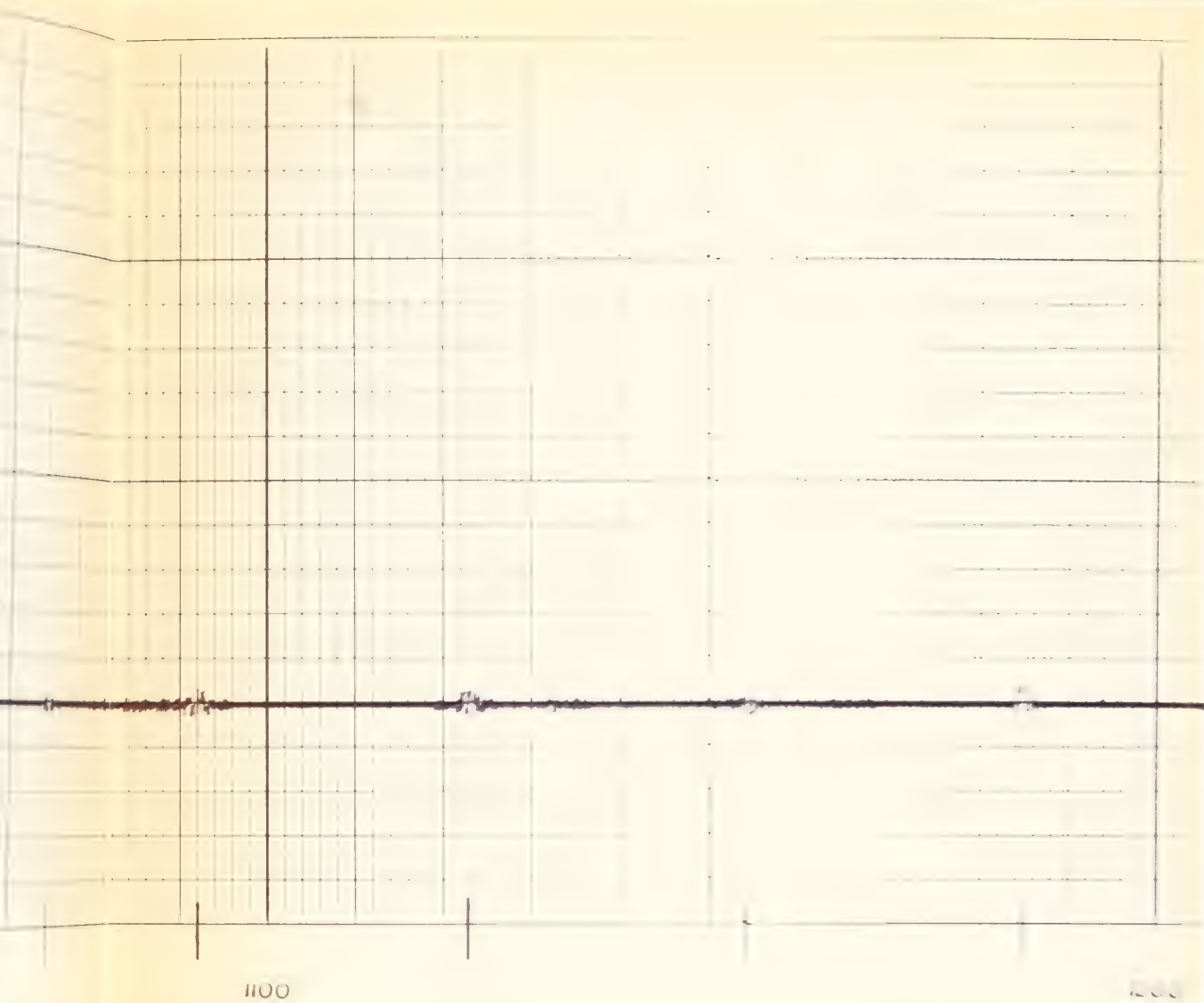






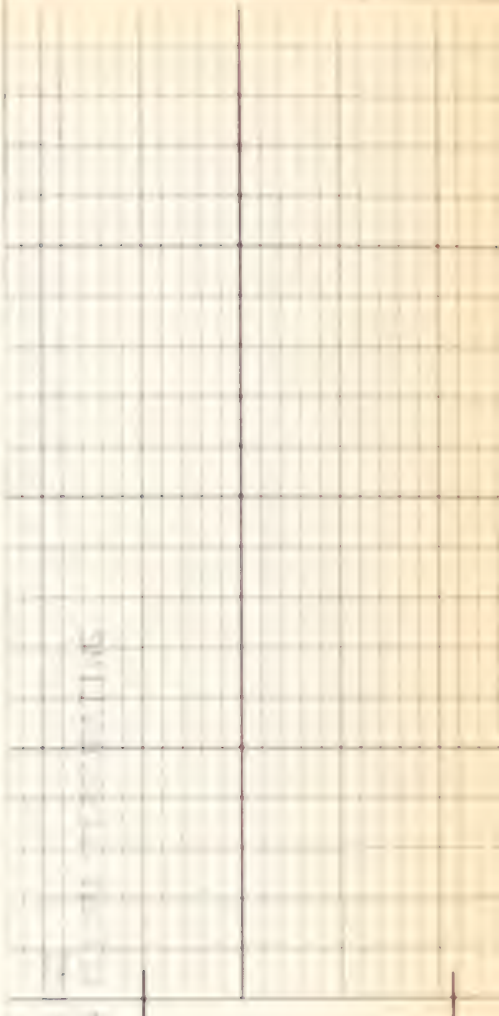
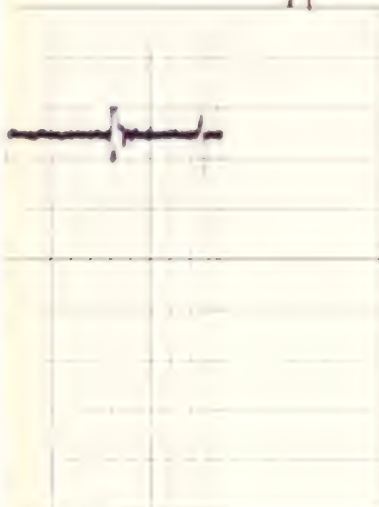
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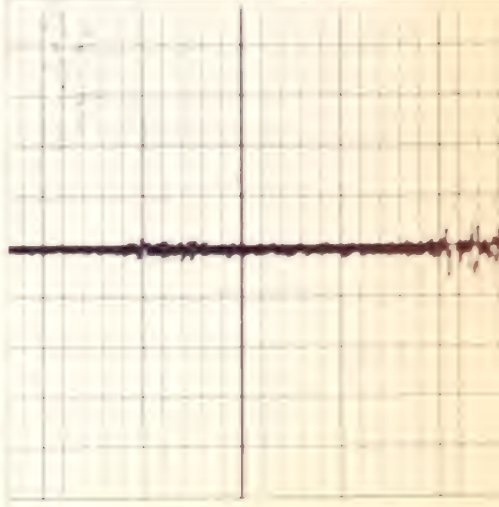


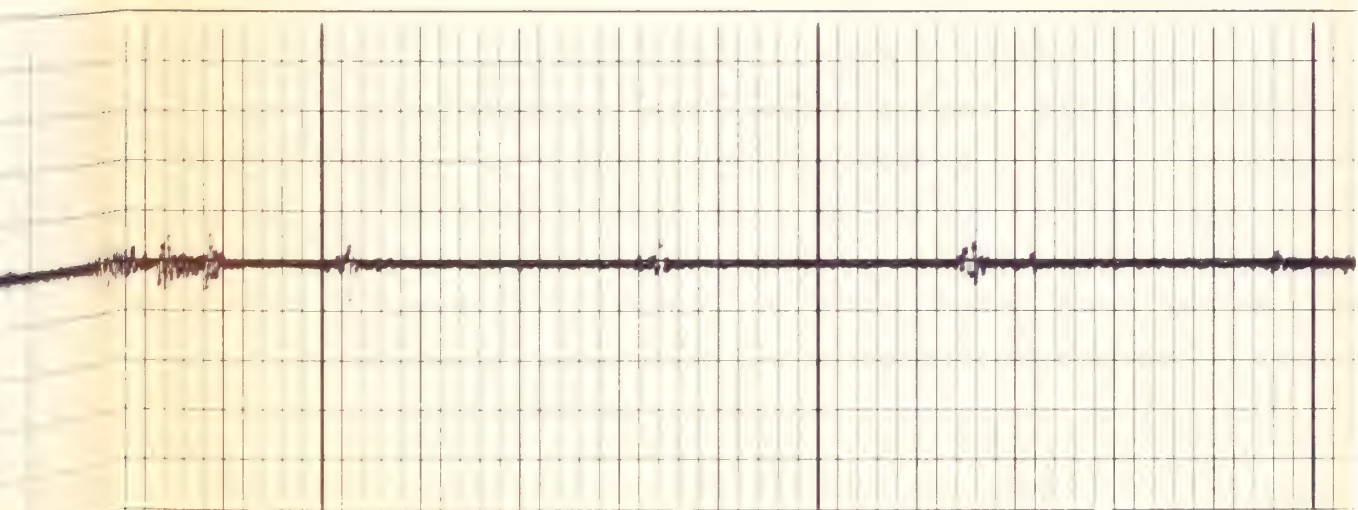
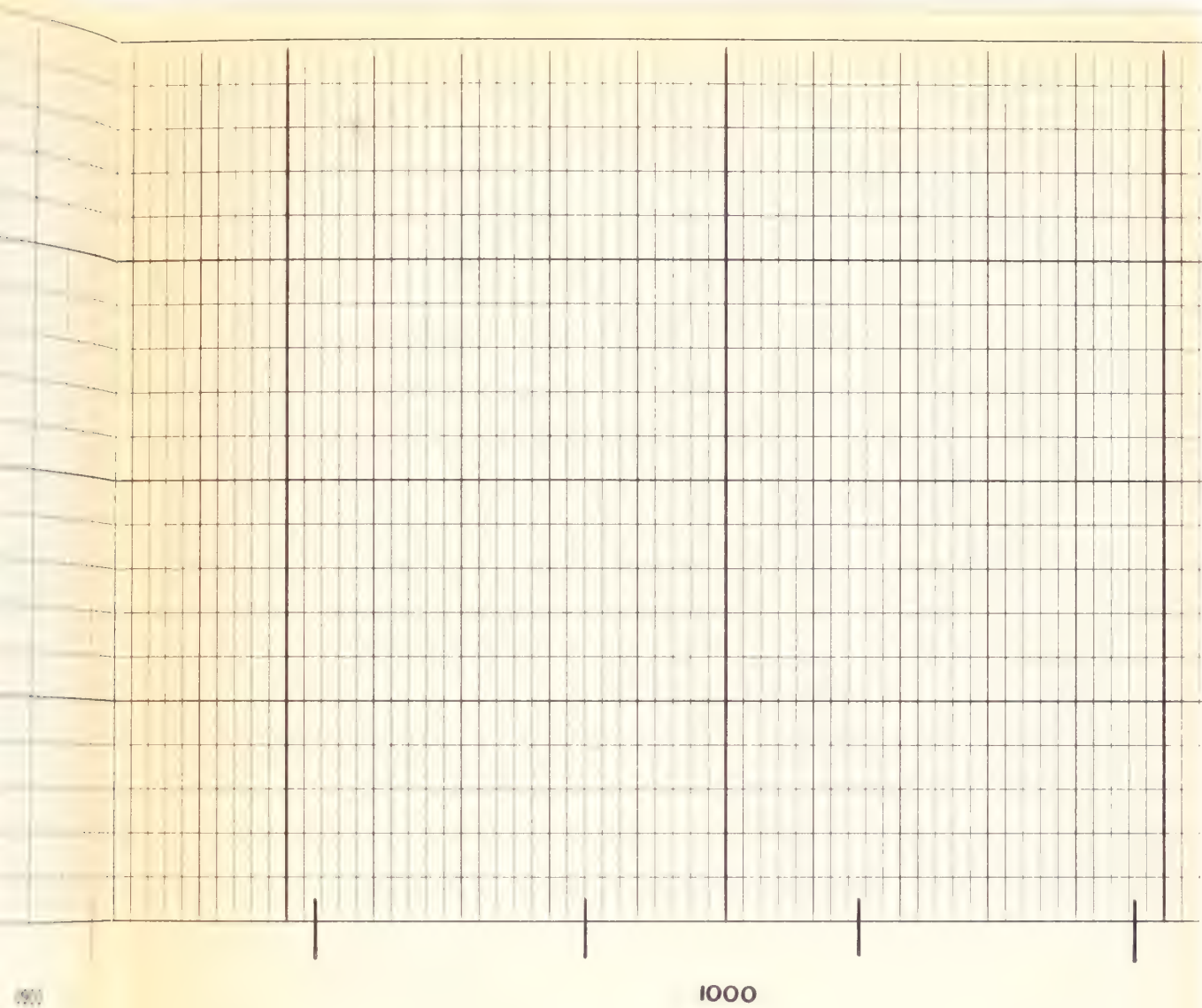
WAVE 8100-100-100-100



WAVE 8100-100-100-100

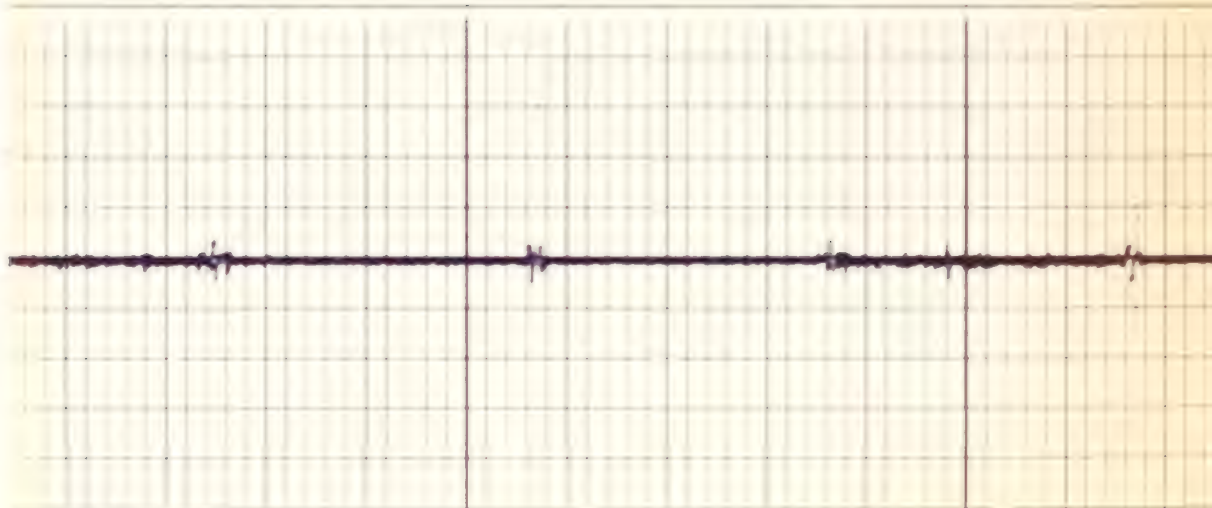
0900

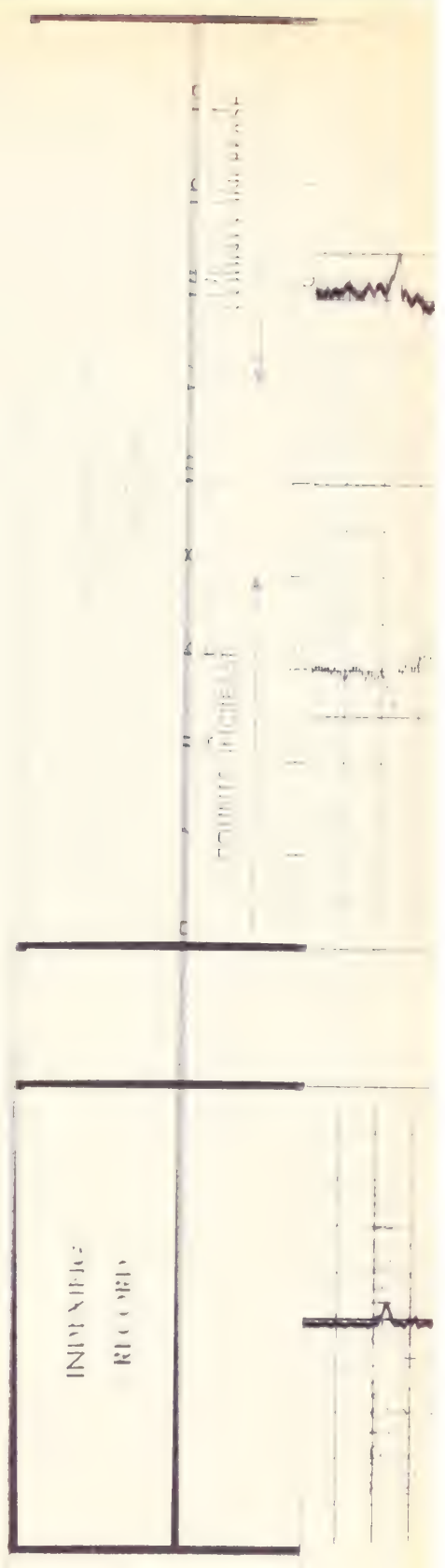
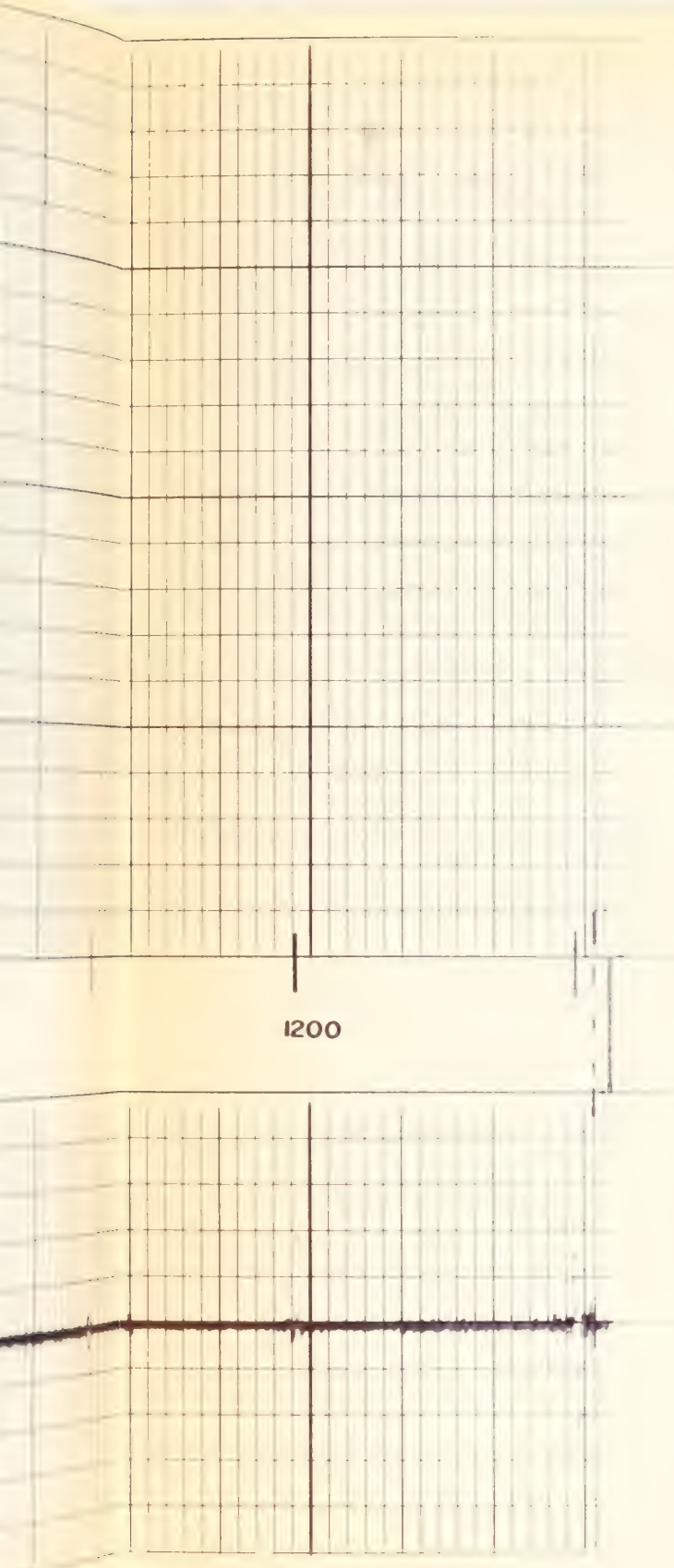


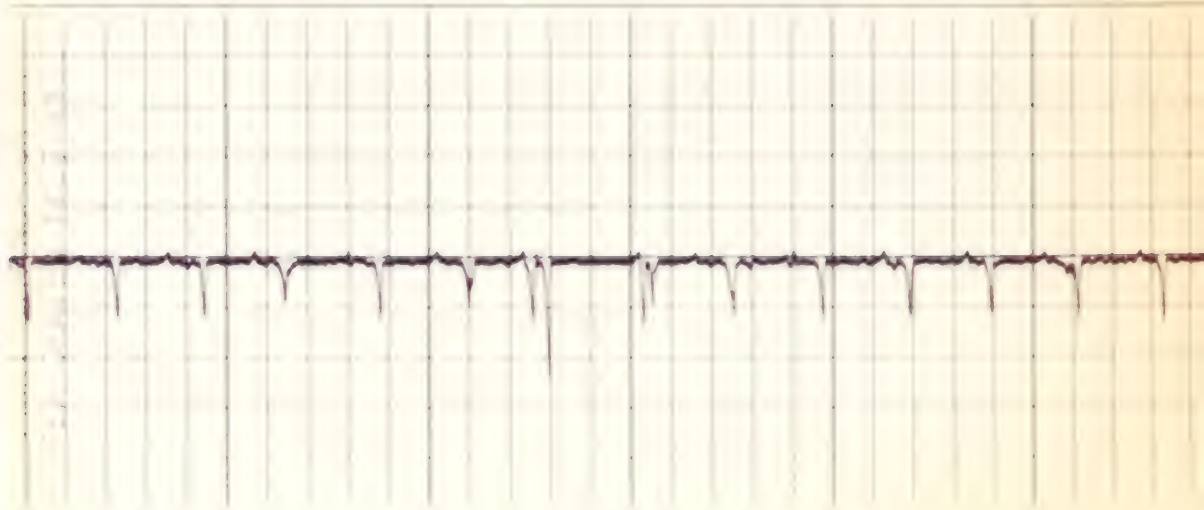
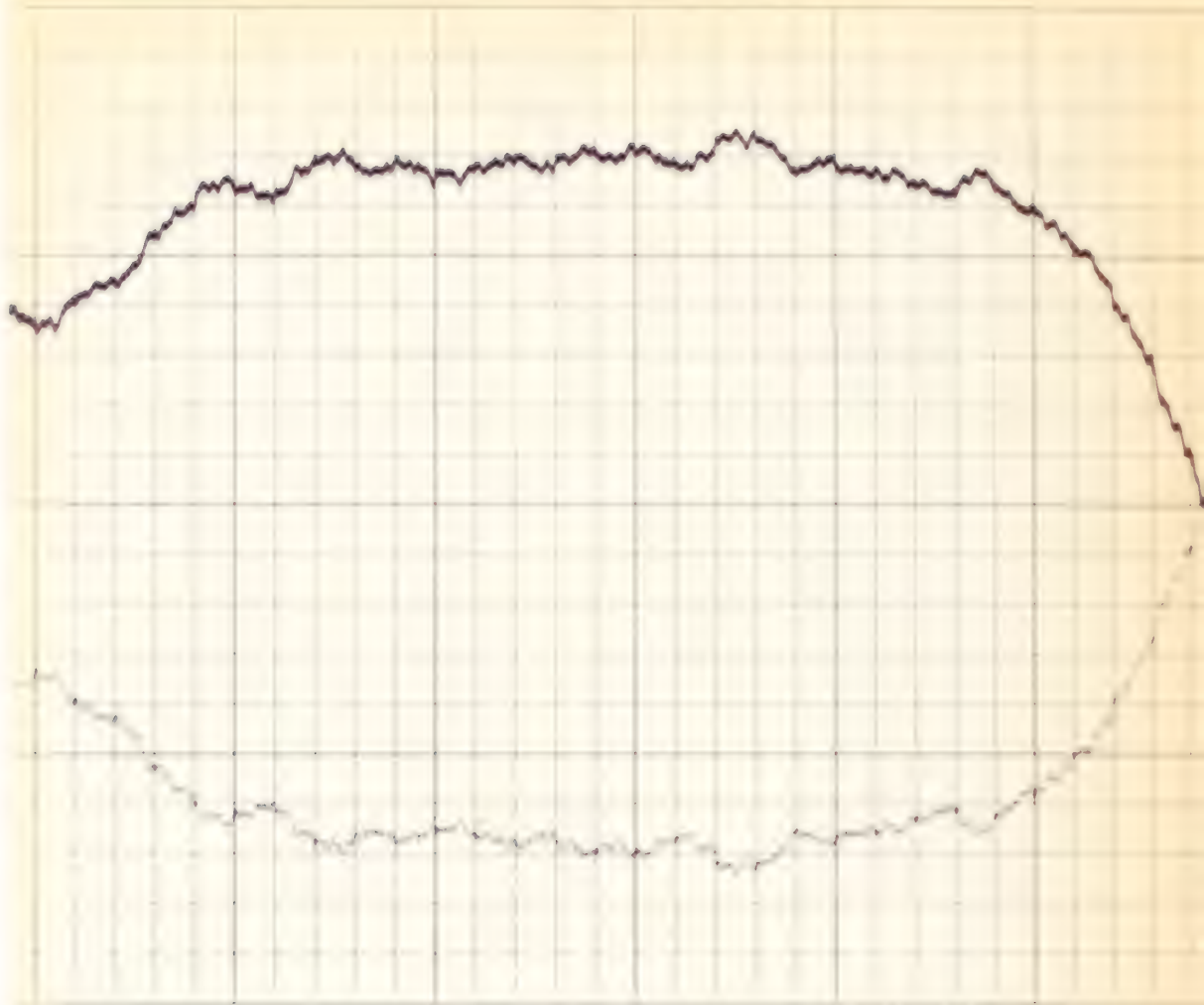


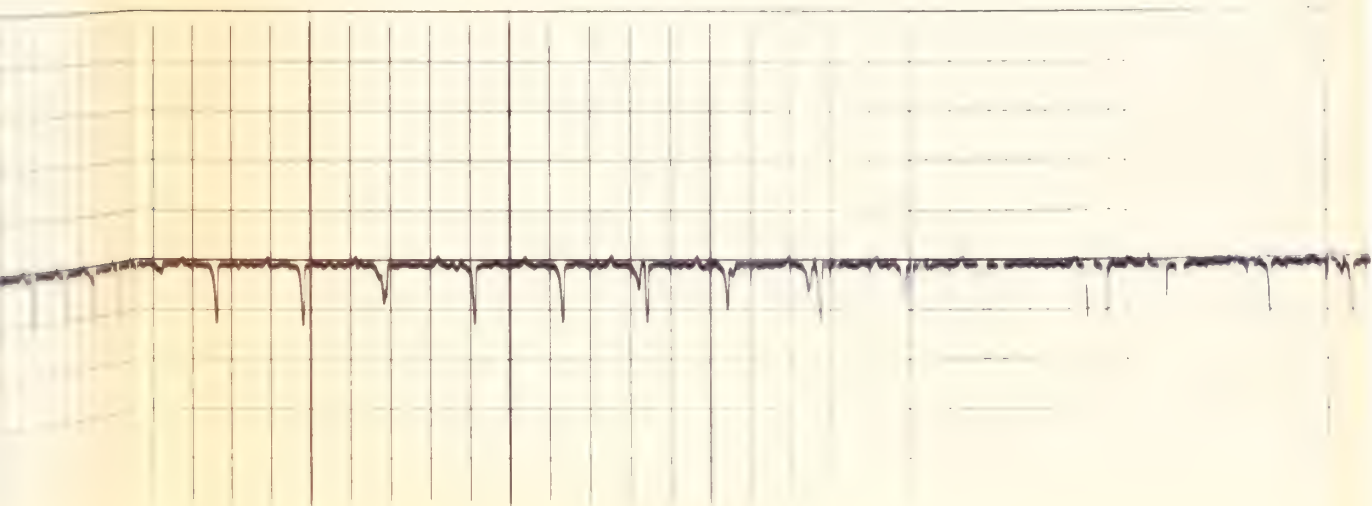
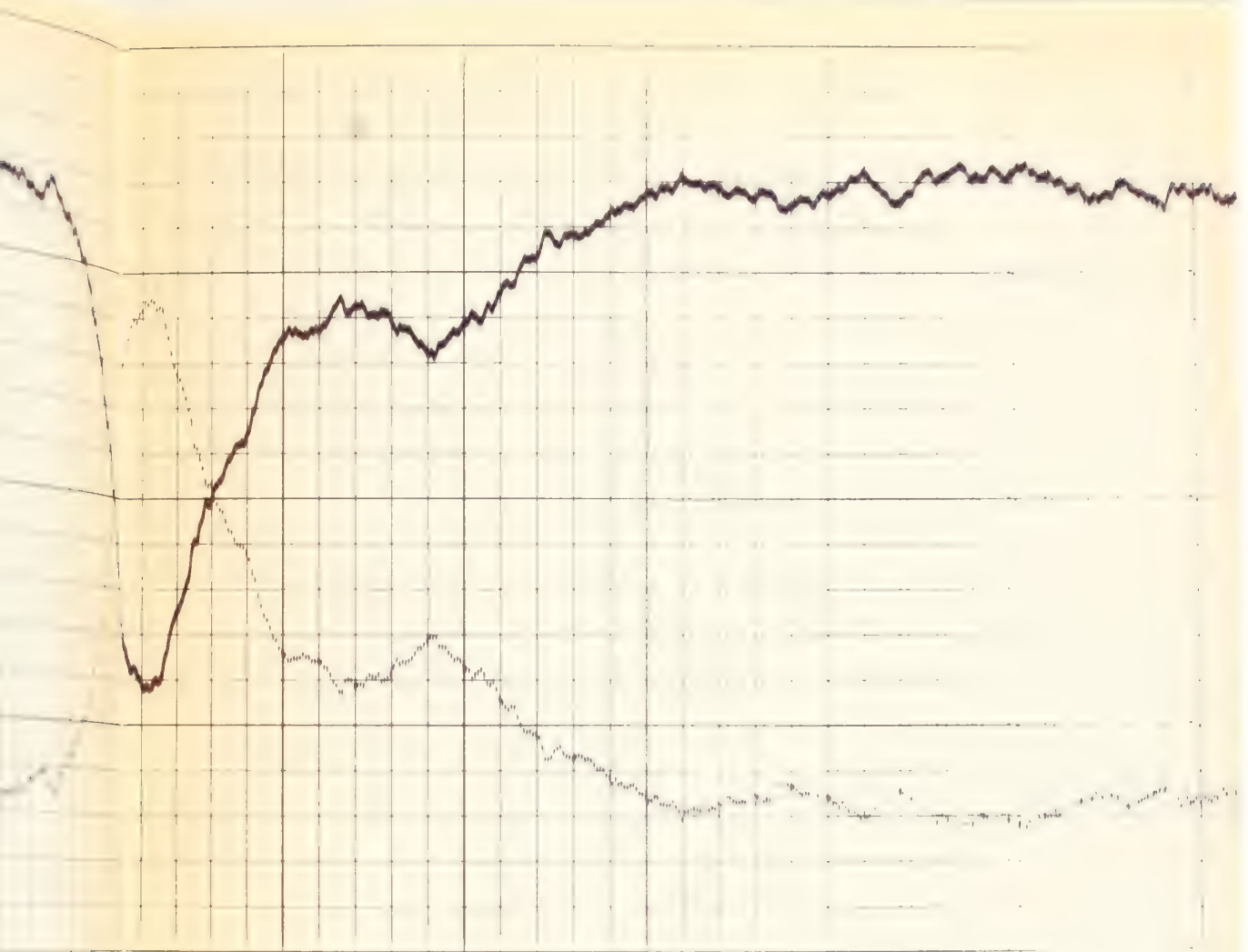


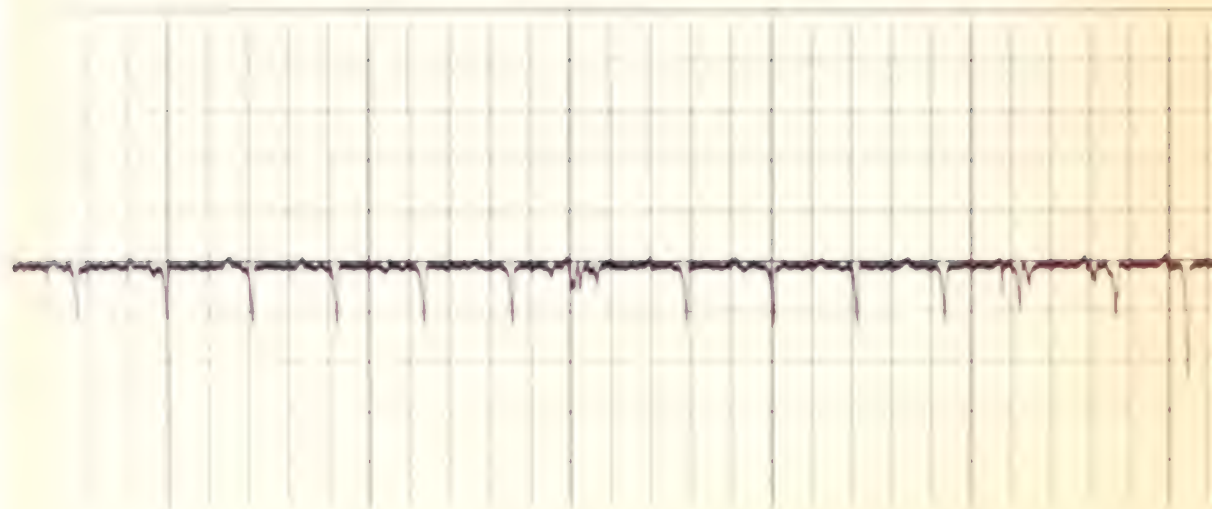
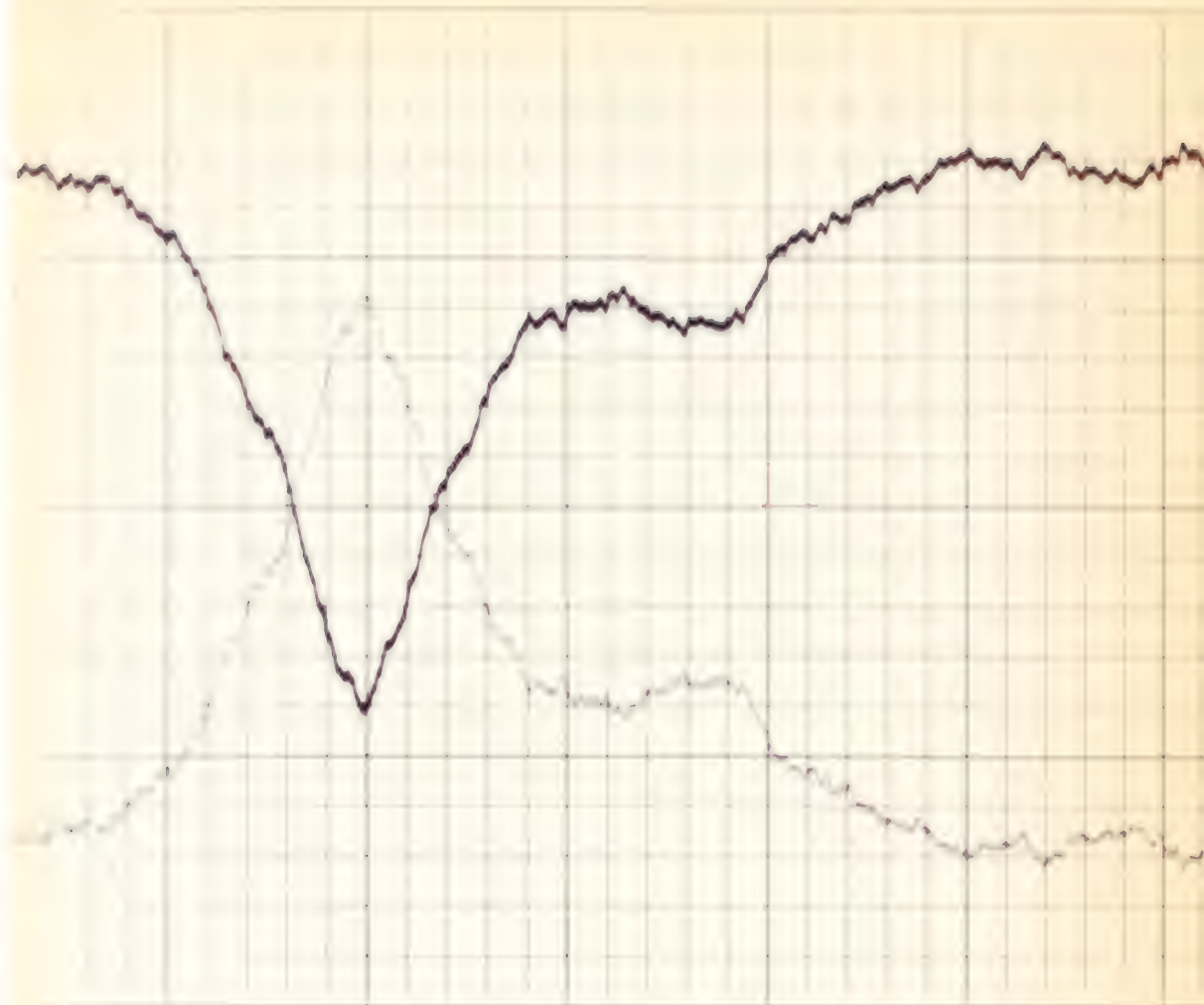
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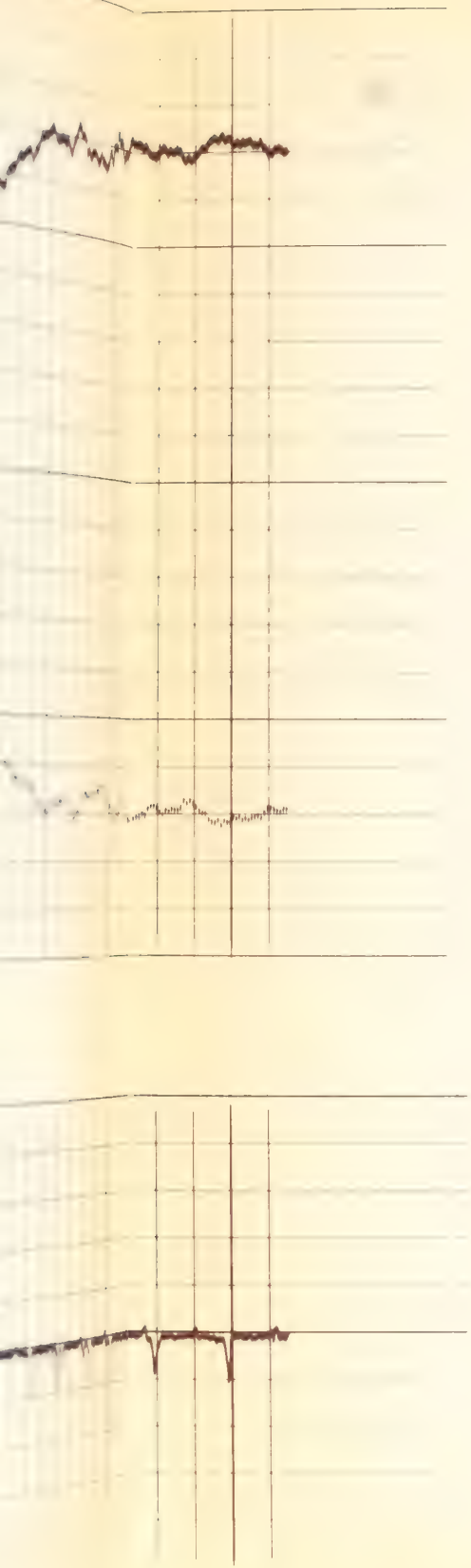




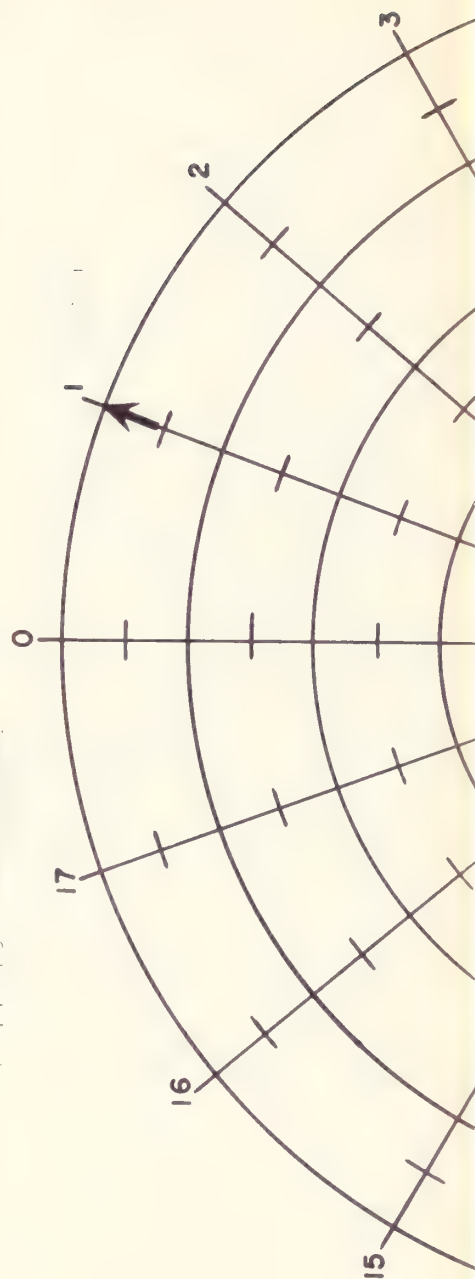


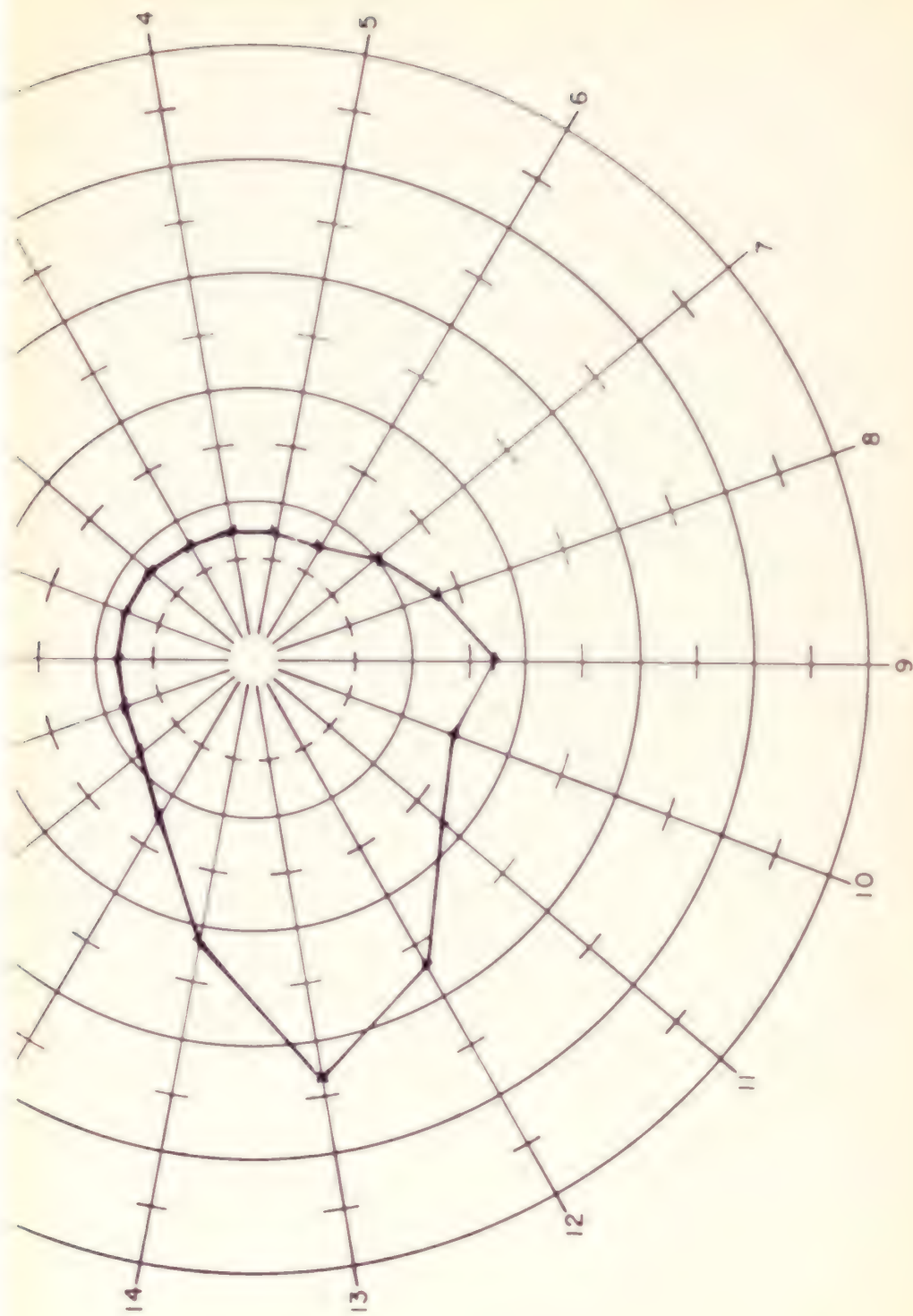






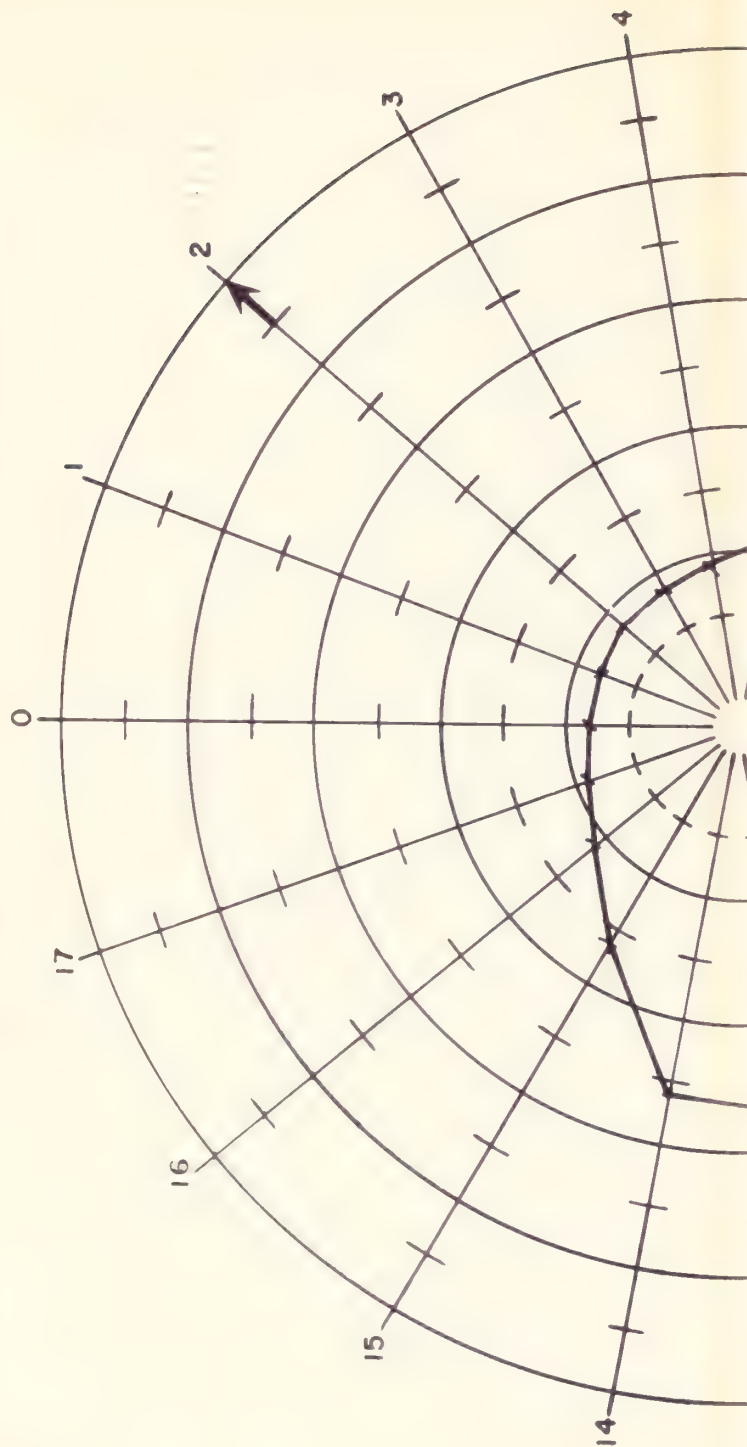
RADIOORIENTATION PLOT POT-B





This curve is a typical example of a Schlumberger sounding curve. The curve shows the relationship between the apparent resistivity (ρₐ) and the electrode spacing (AB). The curve is plotted on a semi-logarithmic grid, where the radial axis represents ρₐ and the logarithmic axis represents AB. The curve shows a sharp increase in resistivity at approximately 10m spacing, indicating a high-resistivity layer at depth.

RADIORIENTATION PLOT POT-B



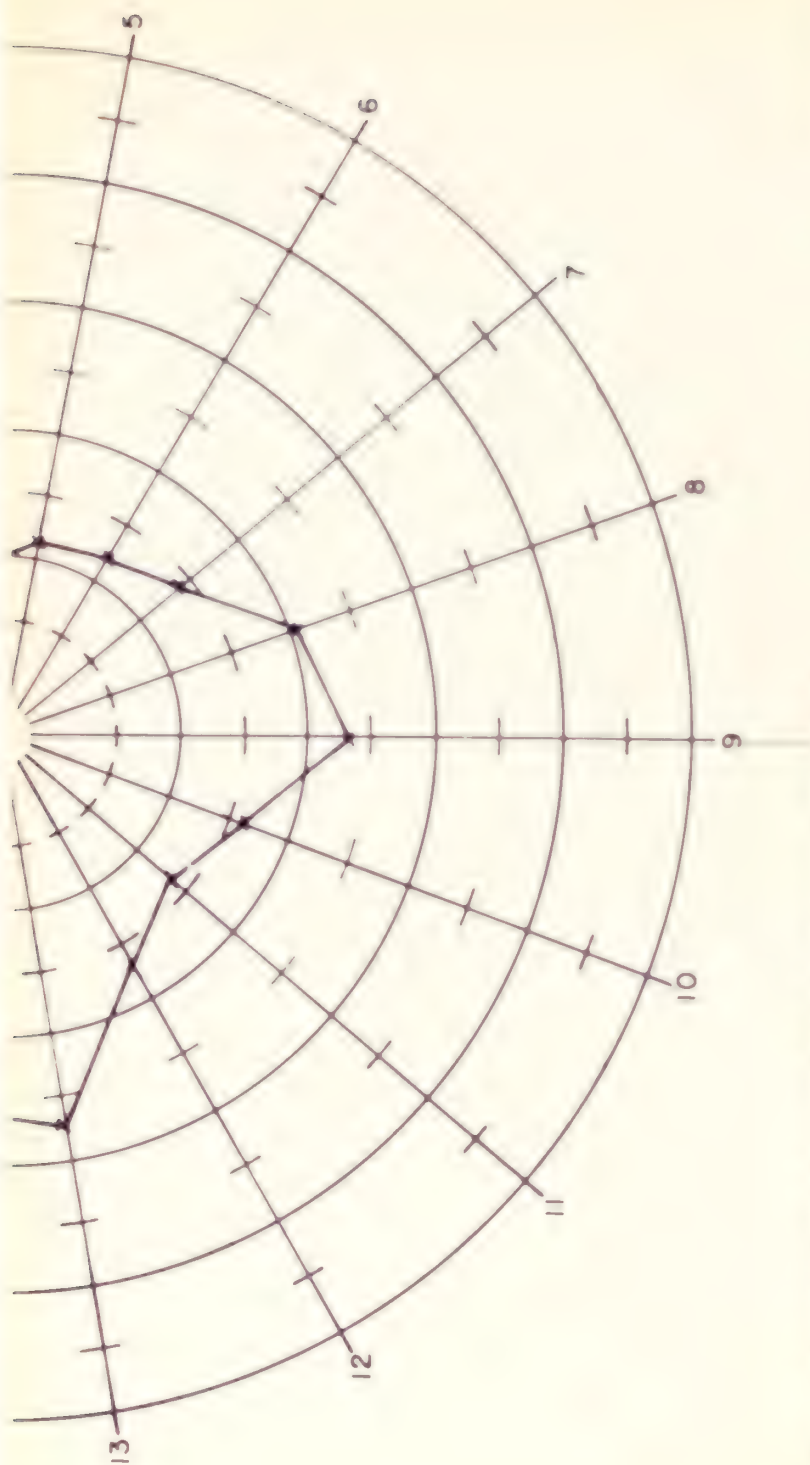
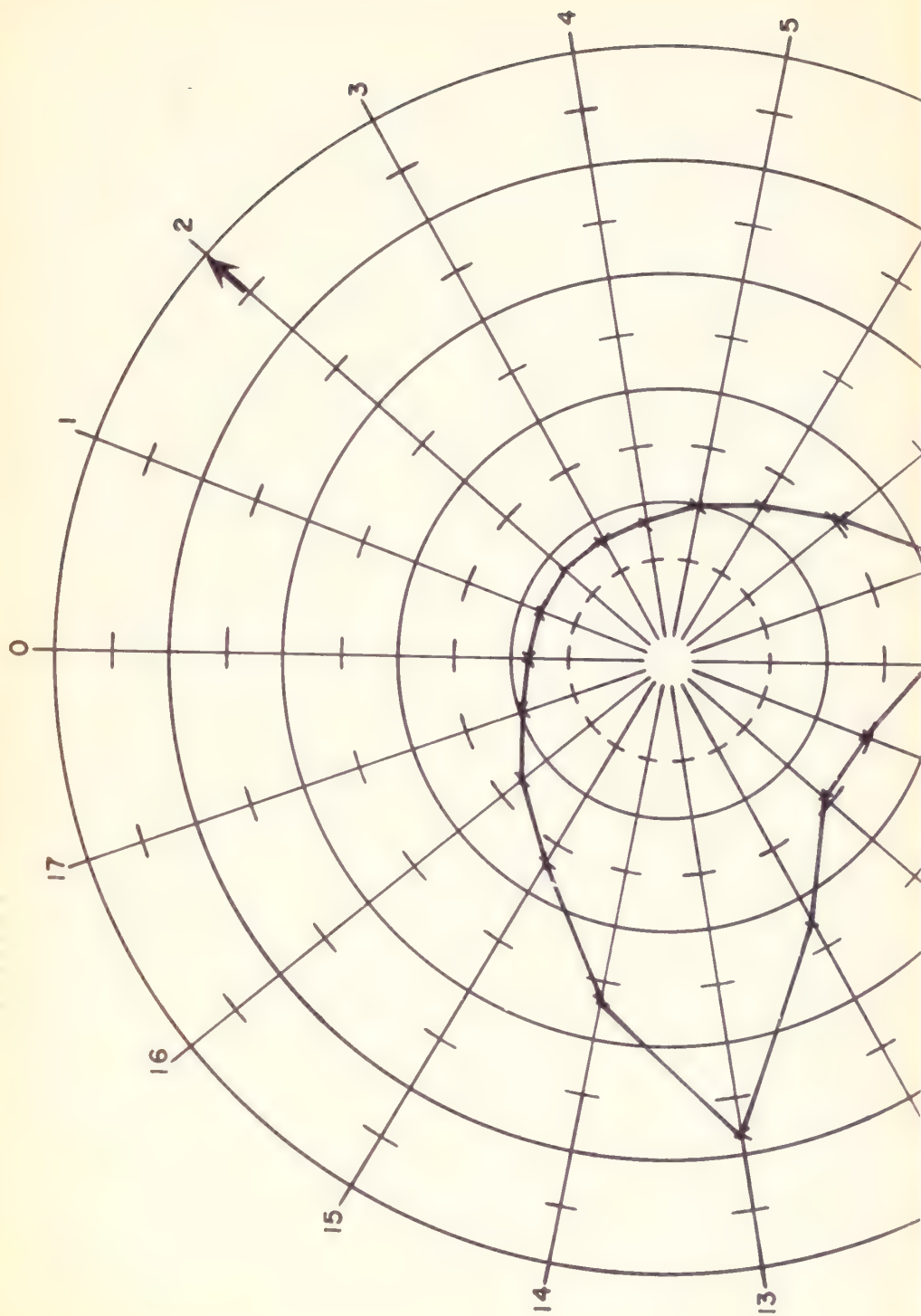


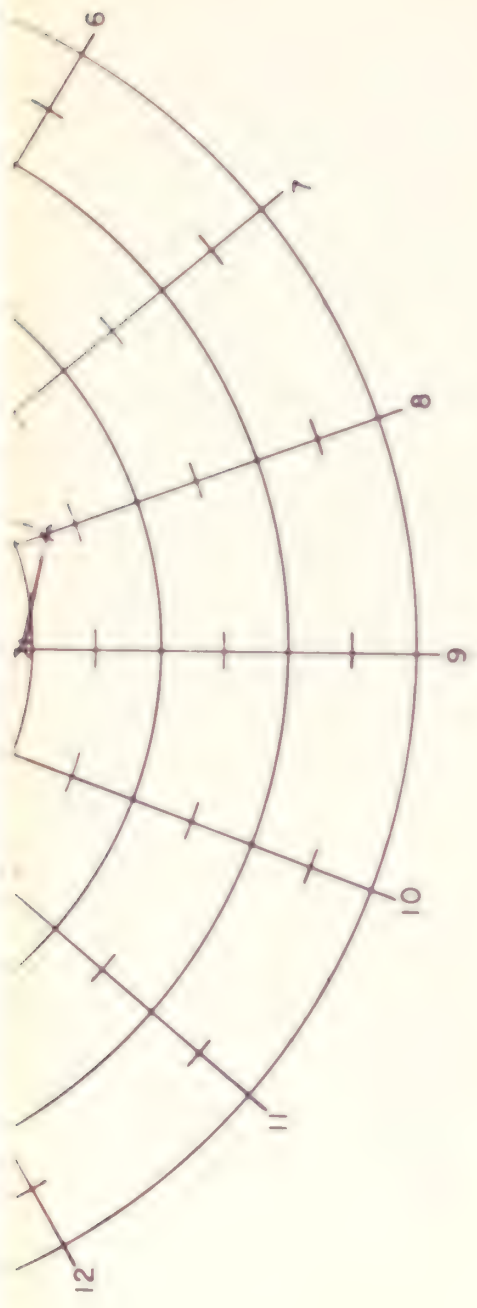
Fig. 3. $\Delta H_{\text{cal}}^{\text{cal}} = 1000 \text{ cal/g}$ (1) and $\Delta H_{\text{cal}}^{\text{cal}} = 1500 \text{ cal/g}$ (2) for the crystallization of polypropylene. The crystallization temperature is 100°C . The crystallization time is 10 min. The crystallization rate is 100%.

RADIO-ORIENTATION PLOT
POT-B

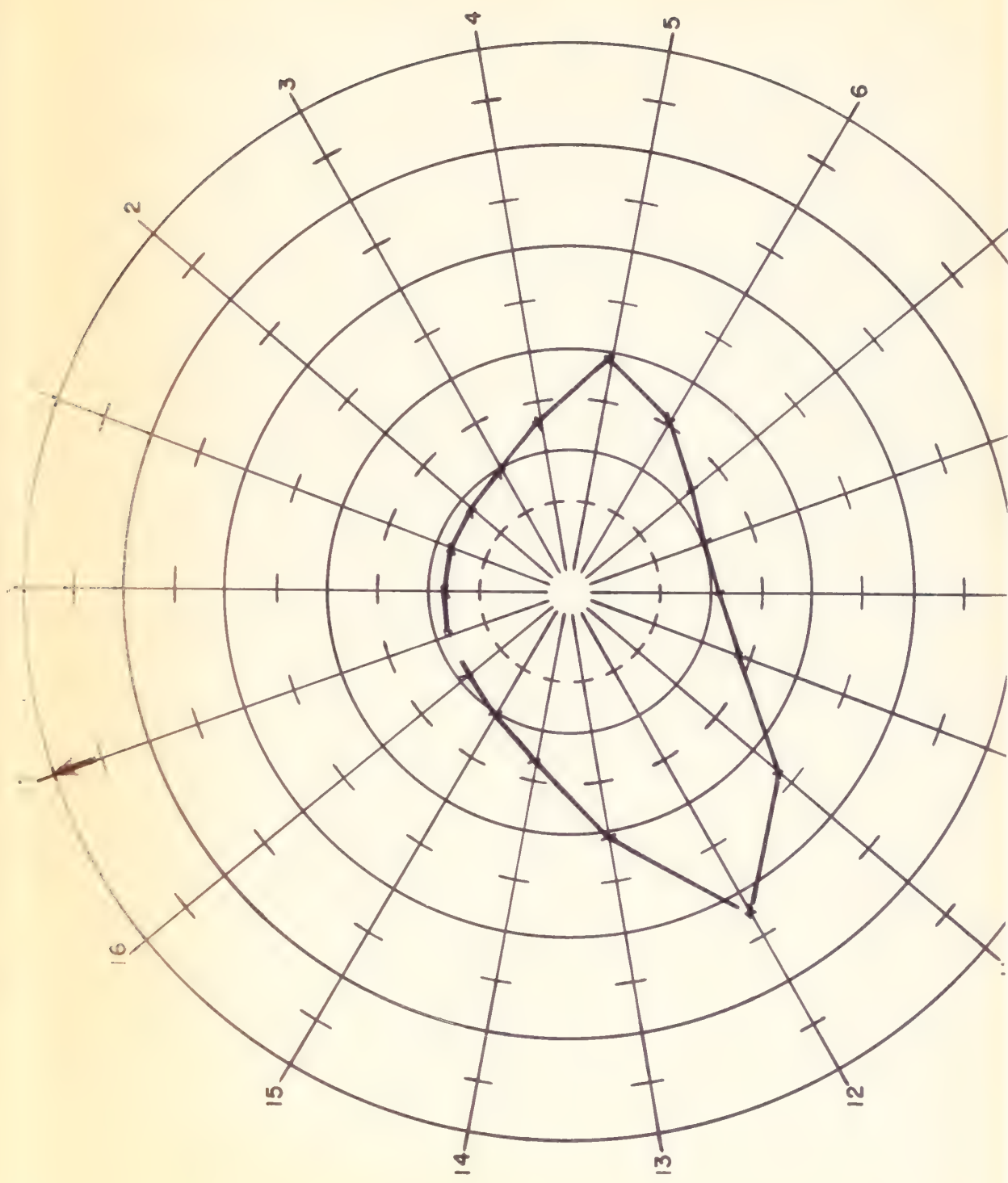


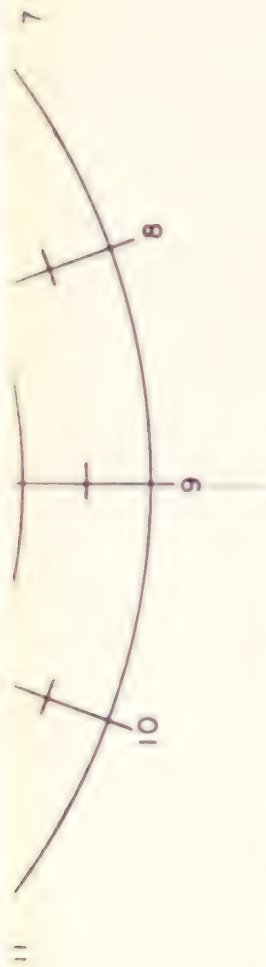
REPRODUCTION OF FIG. 5

Schlumberger



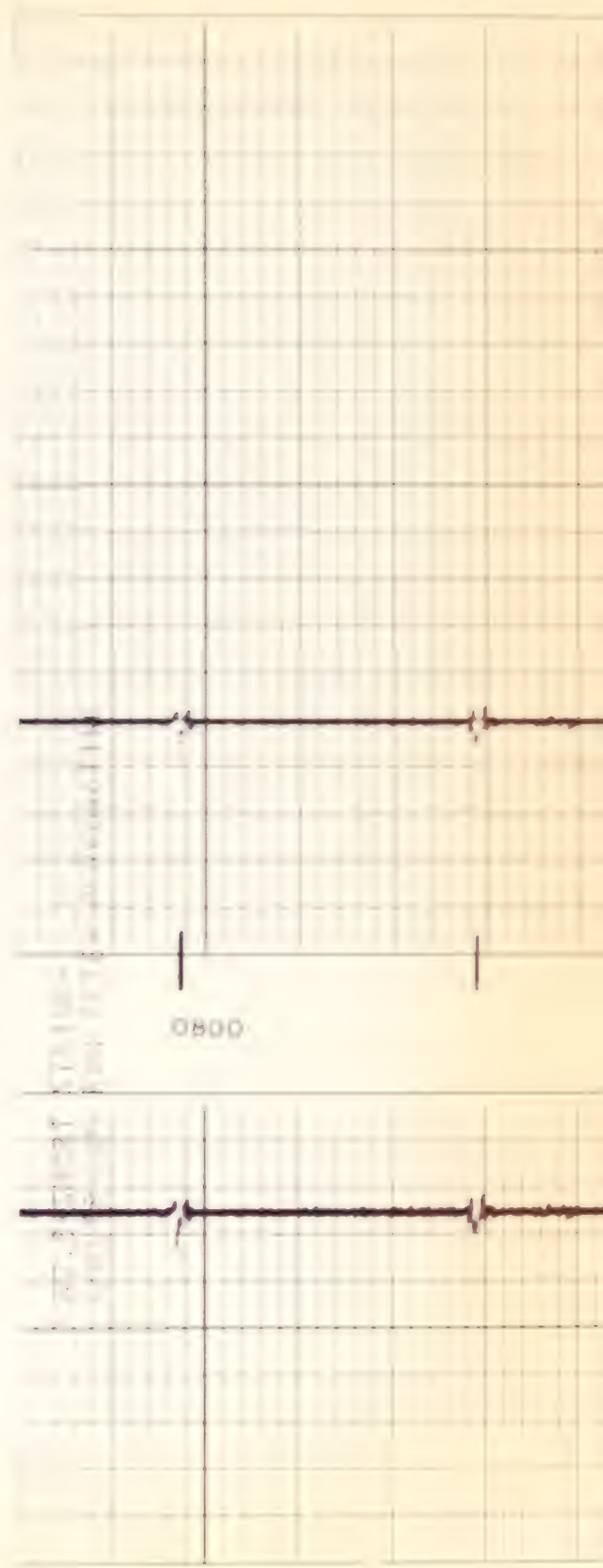
This diagram is a reproduction of a figure from a document. It shows a series of concentric arcs and radial lines, labeled 6 through 12. The diagram is used to illustrate a concept related to the reproduction of a figure.

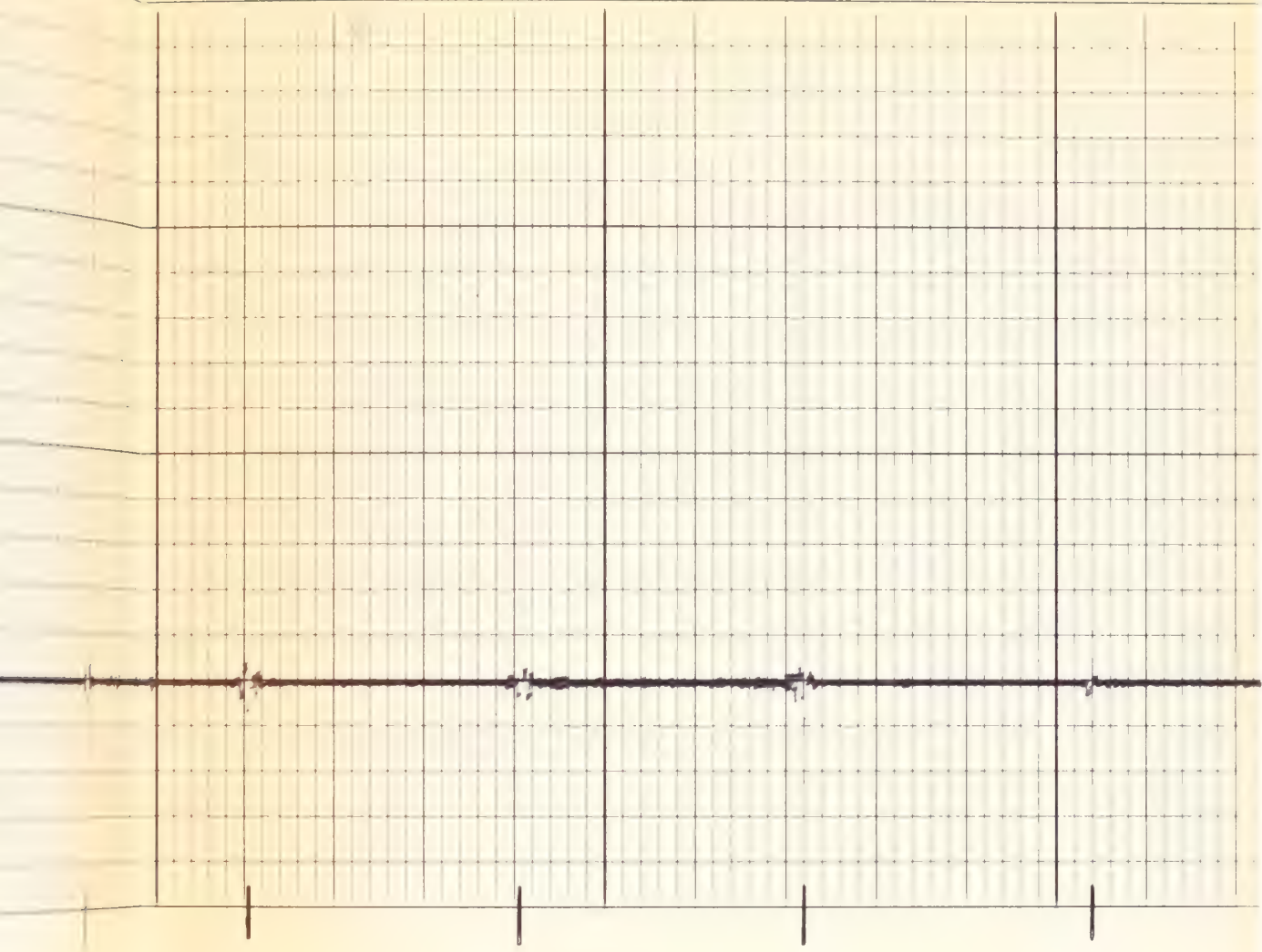




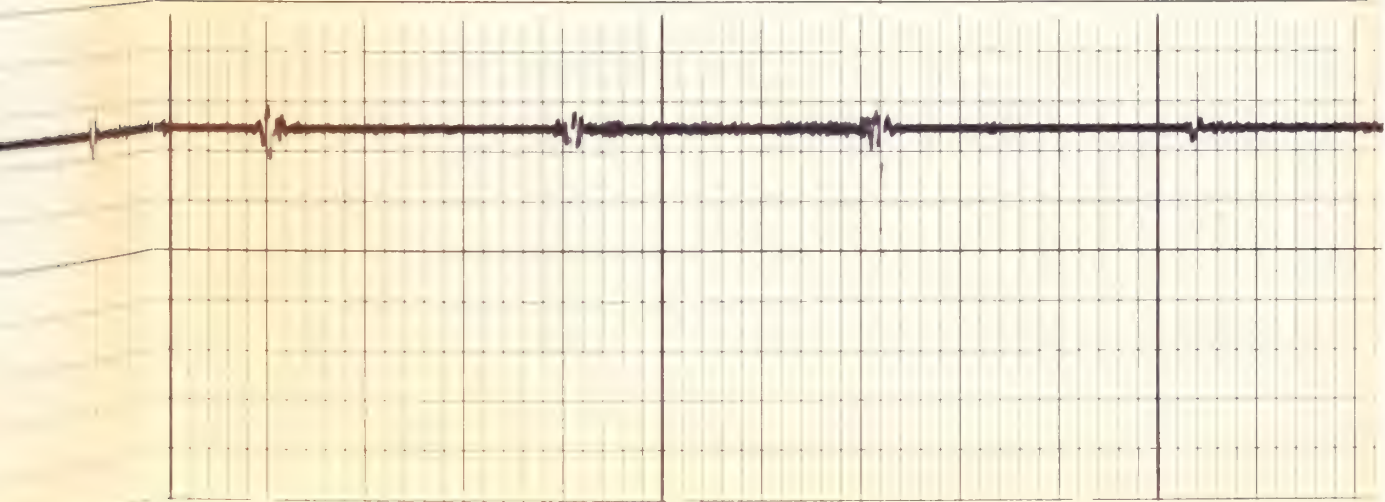
The above conditions are possible interpretations of our readings. Some are possible because of the fact that the readings are not perfect. The readings are not perfect because of the fact that the readings are not perfect. The readings are not perfect because of the fact that the readings are not perfect.

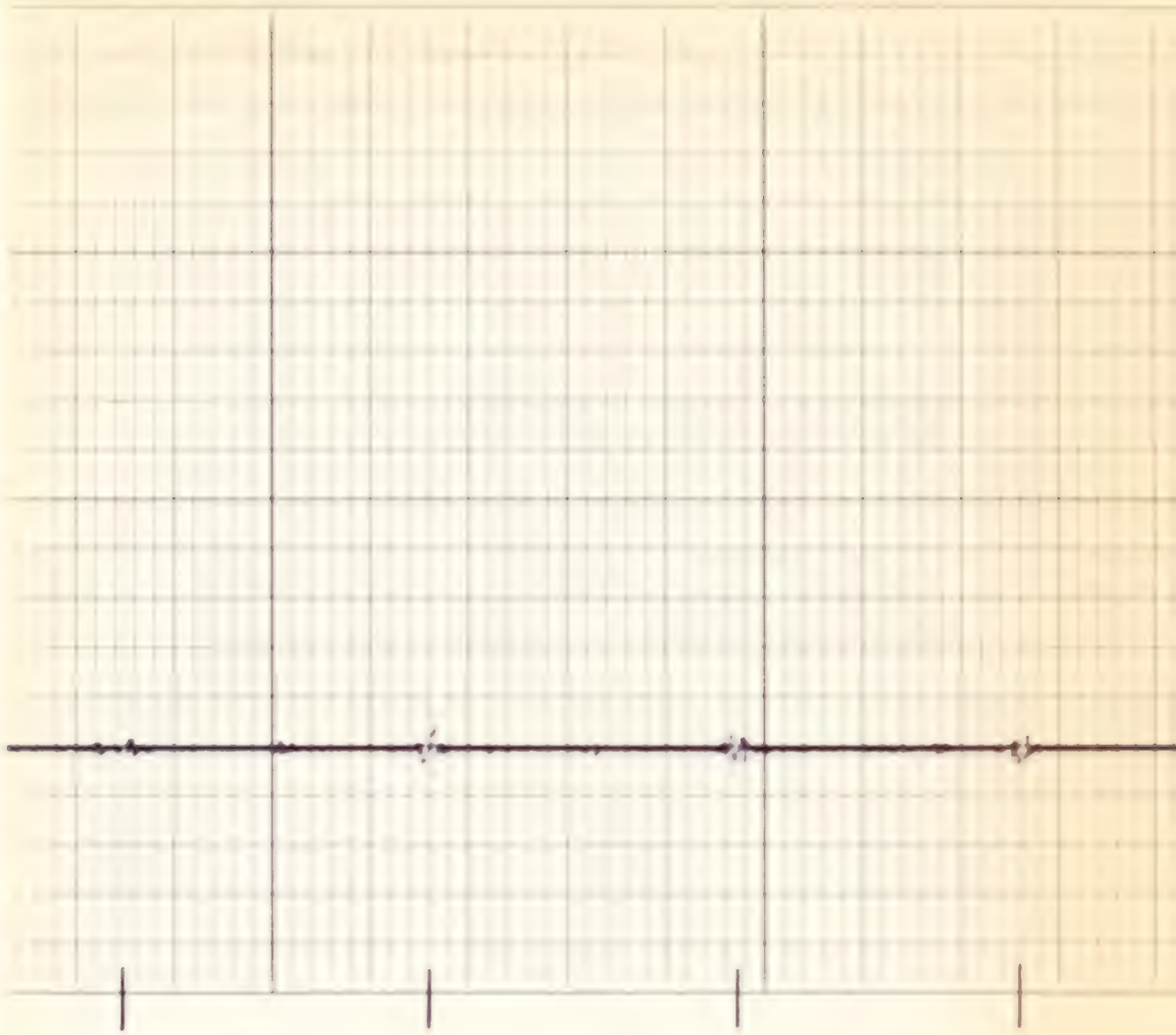
Schlumberger





0900

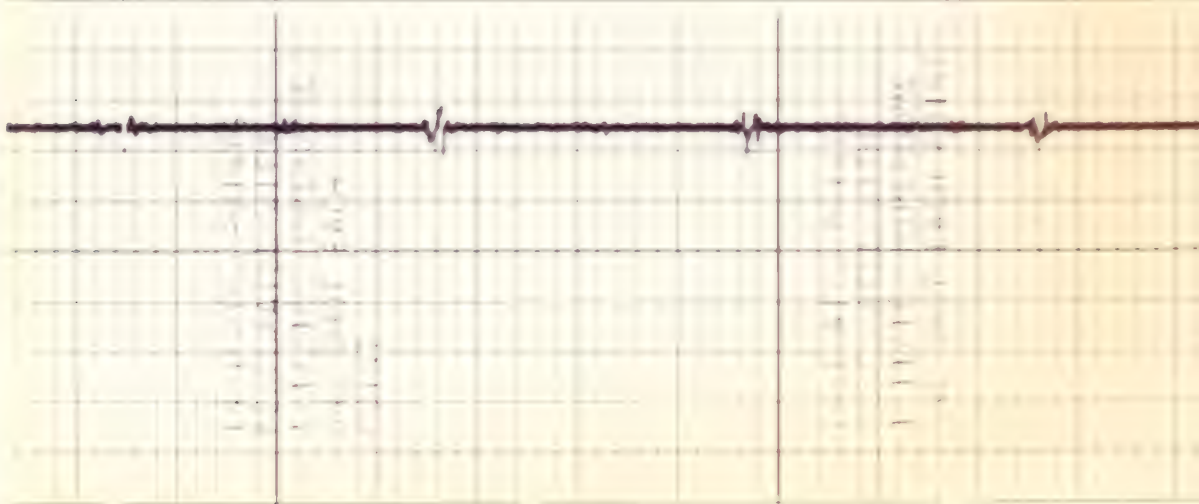


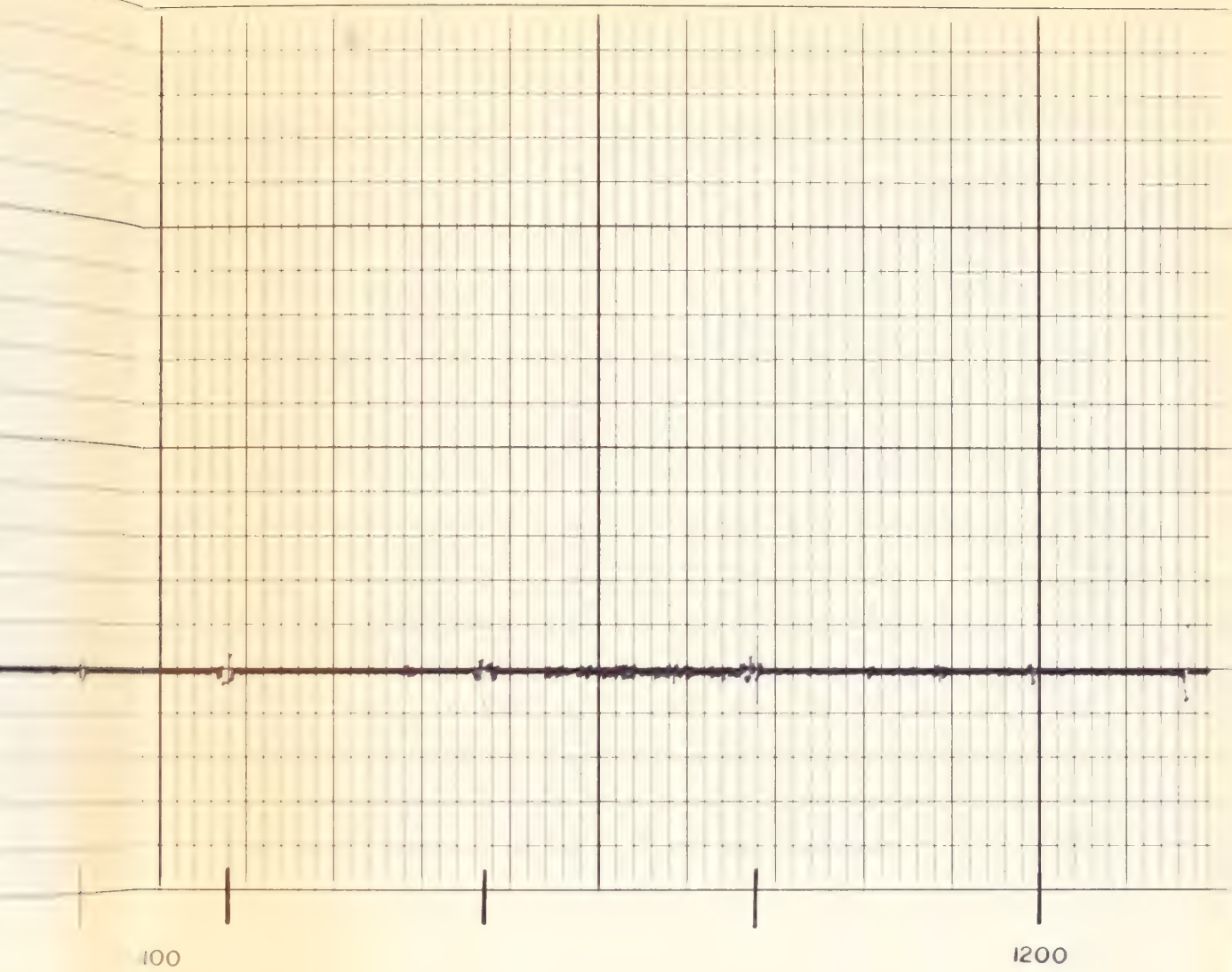


1000

II

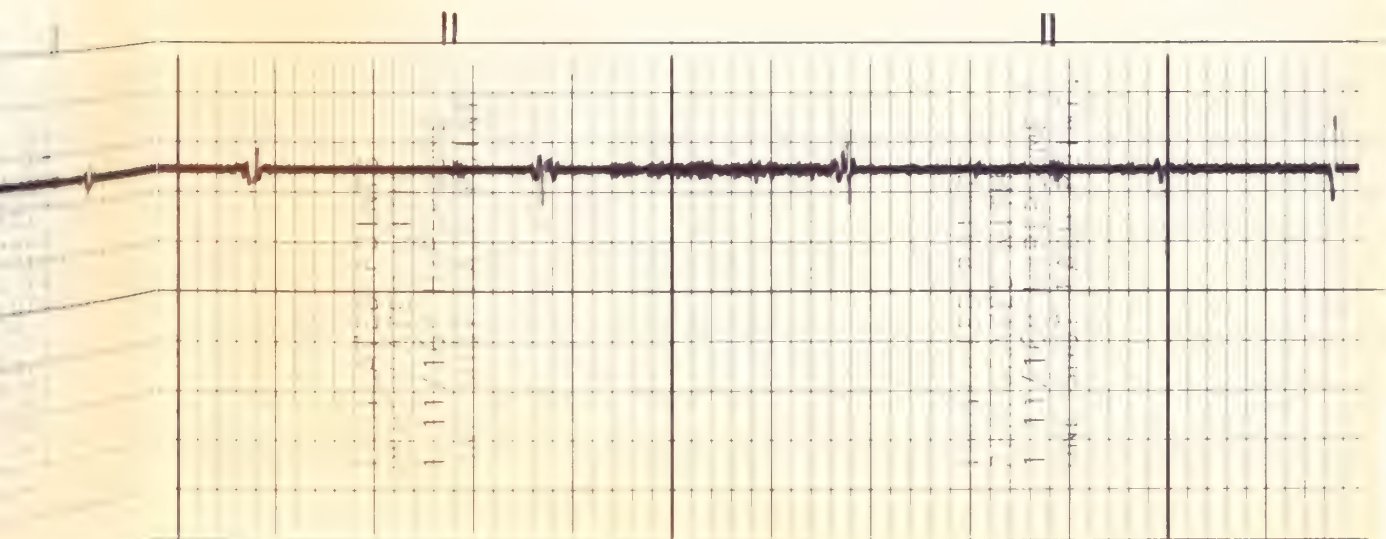
II





100

1200



[illegible]

COMPANY

WELL

FIELD



PRODUCTION LOGGING SERVICES

Schlumberger

CEMENT BOND LOG

GR-CCL-VDL

COUNTY RIO BLANCO

Field or

LOCATION

WELL AT-1C

COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL AT-1C

FIELD

COUNTY RIO BLANCO STATE COLORADO

LOCATION

API Serial No.

Other Services:
ORP-HD

Sec. 7 Twp. 3S Rge. 96W

Permanent Datum: GROUND LEVEL, Elev. 6909
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6909

| | | | |
|-------------------|----------------|------------------|-------------|
| Date | 9-18-74 | Type Drill Fluid | WATER |
| Run No. | ONE/TWO/THREE | Fluid Level | FULL |
| Depth - Driller | 1638/1528/1373 | Max. Rec. Temp. | °F |
| Depth - Logger | 1636/1530/1375 | Est. Cement Top | 1010 |
| Btm. Log Interval | 1628/1522/1367 | Equip. Location | 3862 VERNAL |
| Top Log Interval | 900/ 900/ 880 | Recorded By | ST. AUBYN |
| Open Hole Size | 7 7/8 | Witnessed By | ROSS/ELLARD |

| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom |
|----------------|-------|-------|-------|------------|------|--------|
| Surface String | 8 5/8 | | | T-C | SURF | 60 |
| String (1) | 2 3/8 | 4.7 | | T-C | SURF | 1643 |
| String (2) | 2 3/8 | 4.7 | | T-C | SURF | 1528 |
| String (3) | 2 3/8 | 4.7 | | T-C | SURF | 1373 |

PRIMARY CEMENTING DATA

| | | |
|--------------------|---------|----------------------------|
| STRING | Surface | STRINGS ONE, TWO AND THREE |
| Vol. of cement | | 120 SKS. |
| Type of cement | | HOWCO LT. WT. |
| Additive | | 10#/SK- GILSONITE |
| | | 0.3% LWL |
| Retarder | | |
| Wt. of slurry | | |
| Water loss | | |
| Type fluid in csg. | | |
| Fluid wt. | | |

The well name, location and borehole reference data were furnished by the customer.

| PRIMARY CEMENTING PROCEDURE | | | REMARKS | |
|-----------------------------|---------------------|-------------------------------|---|--|
| Hour — date | | Hours from start of operation | Service Order No. 5936 | |
| Started pumping cement | | | Csg. Collars Recorded 19 ft. DEEP | |
| Release pressure | 16:18 9-11-74 | | | |
| Start Cement Bond Log | 12:00 9-18-74 | | | |
| Finish Cement Bond Log | 17:00 9-18-74 | | | |
| Preceding fluid | Volume bbls./minute | bbls. | Pipe reciprocated during Pumping: Yes No | |
| Cement pumped | | | Pipe reciprocated after plug down: Yes min., No | |

| SQUEEZE JOB DETAIL | | | EQUIPMENT DATA | Centralizer Depths | Scratcher Depths |
|------------------------|------|----|-----------------------|--------------------|------------------|
| Squeeze number | 1 | 2 | Sonic Panel No. | SLP-FIVE | |
| Date | | | Sonic Cart No. | SLC-A 4445 | |
| Depth interval | | | Sonic Sonde No. | SLS-JUGOS | |
| Type cement | | | CRP No. | 14 | |
| Volume of cement | | | Mem Panel No. | MP-SER201 | |
| Additive | | | GR Panel No. | 356 | |
| Retarder | | | GR Cart No. | SHI-AFA#31 | |
| Weight of slurry | | | Centralizer: Type No. | CME-V GAL-A | |
| Preceding fluid | | | To Level (MV) | 100 | |
| Breakdown pressure | | | Cart. Gain | 1730 | |
| Max. pressure-stage 1 | | | CRP Intensity | .16 | |
| " " 2 | | | R9G Intensity | 21 | |
| " " 3 | | | Logging Speed | 30 FPM | |
| Final maximum pressure | | | Time Constant | | |
| Started pumping cement | | | | | |
| Released pressure | | | | | |
| Start CBL | | | | | |
| Finish CBL | | | | | |
| AVERAGE WELL DRIFT: | from | to | | | |

| TRANSIT TIME | CASING BOND | VARIABLE DENSITY |
|--------------|-------------|------------------|
| from | to | to |

WELL DRIFT
from

TRANSIT TIME

MICROSECONDS _____ SPACING
400 200

GAMMA RAY

API UNITS

DEPTH

CASING BOND

MILLIVOLTS

100

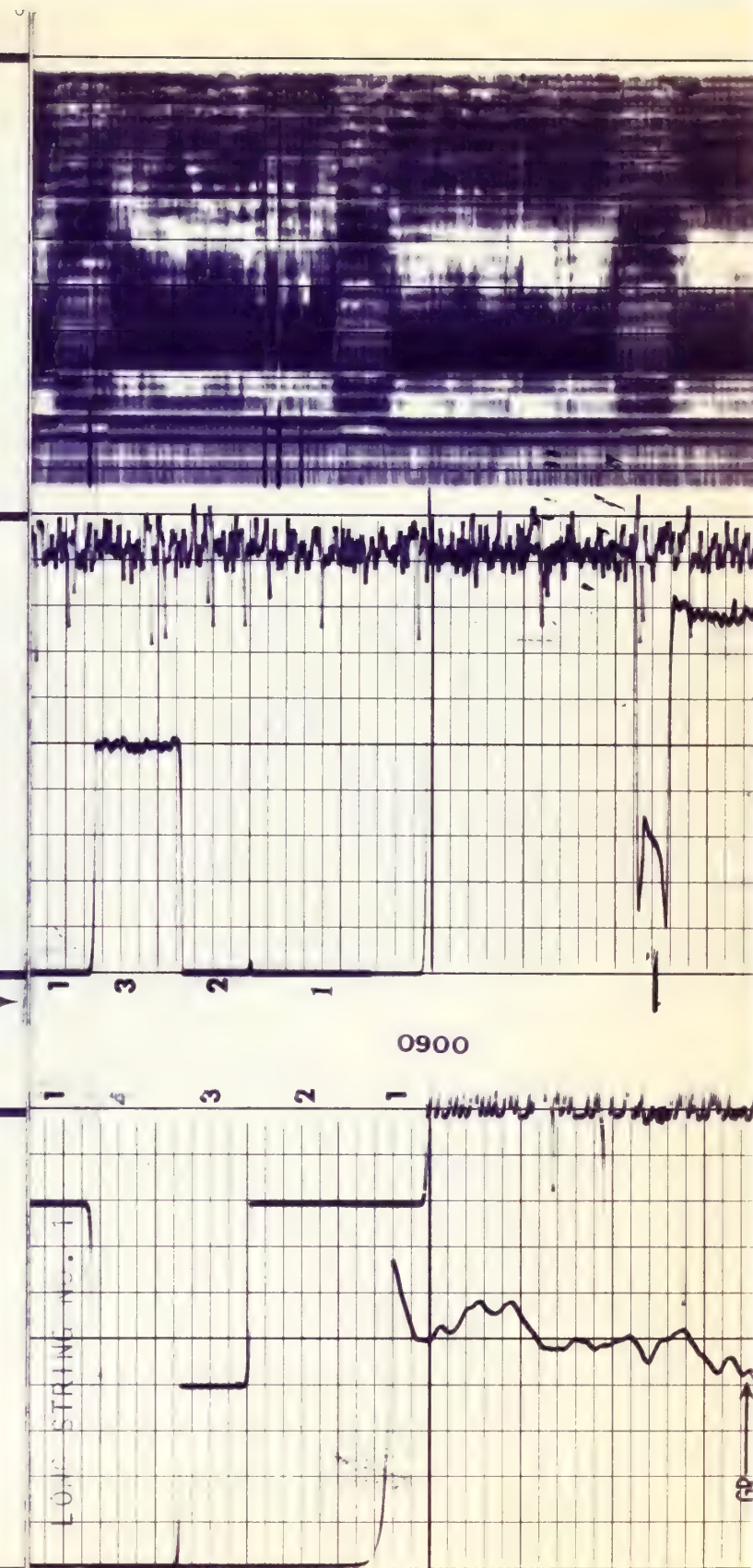
VARIABLE DENSITY

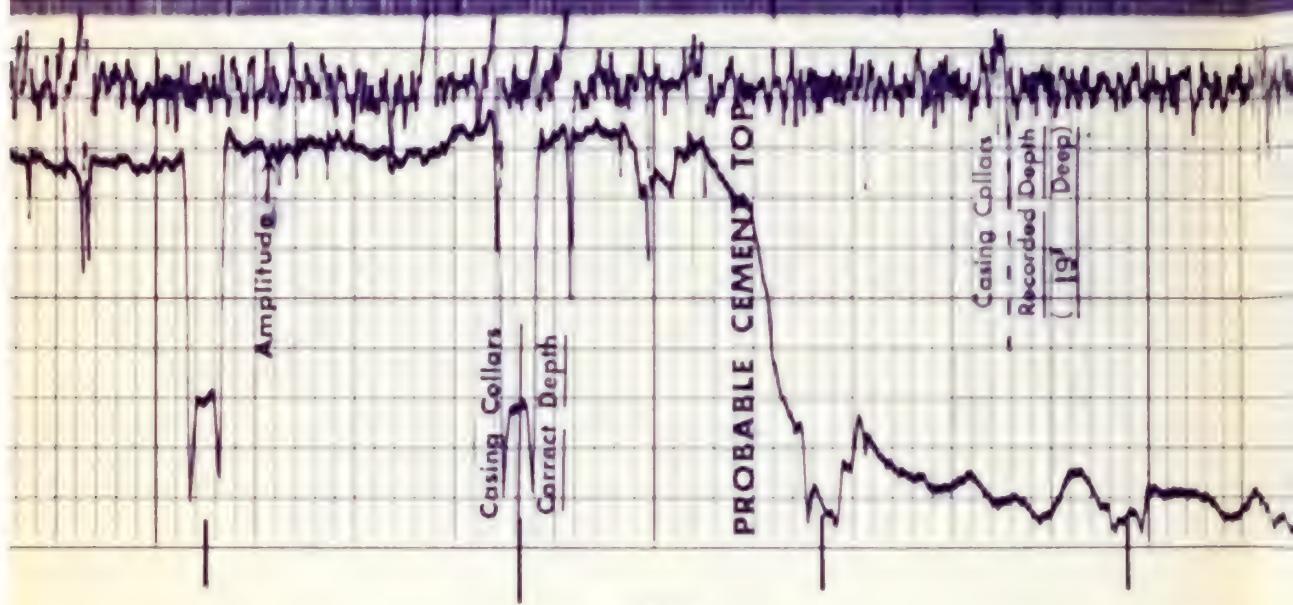
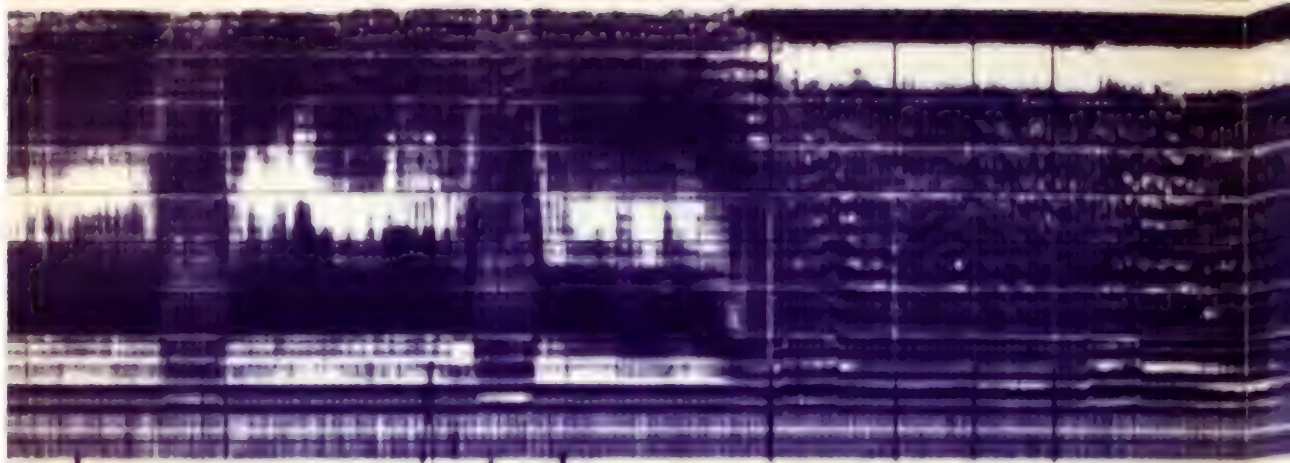
MICROSECONDS _____ SPACING

200 1200

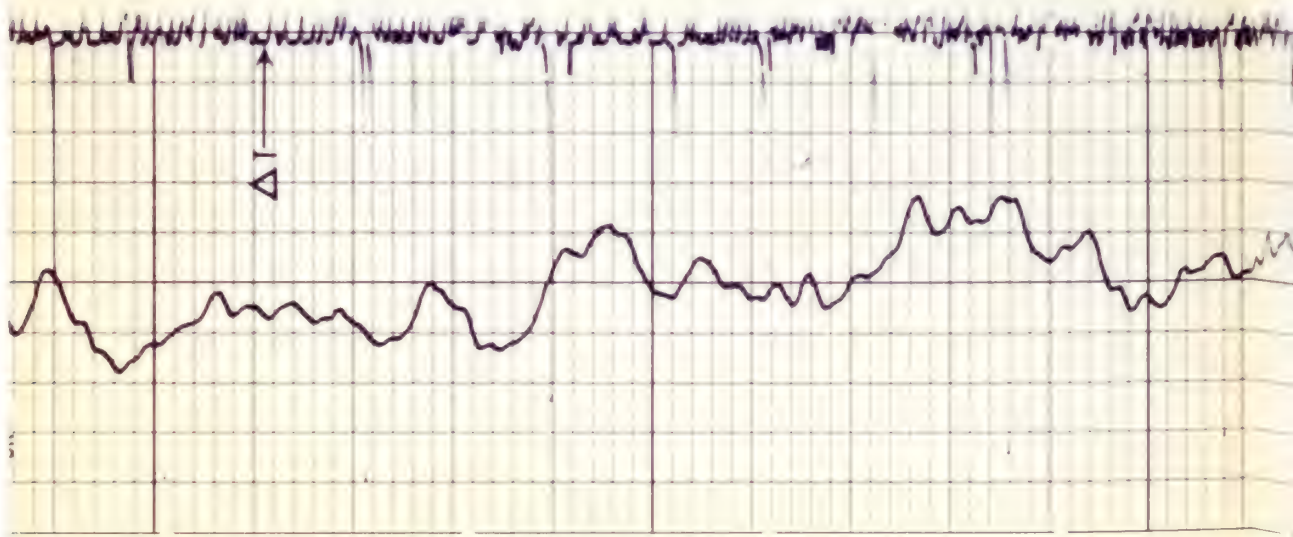
5' SPACING

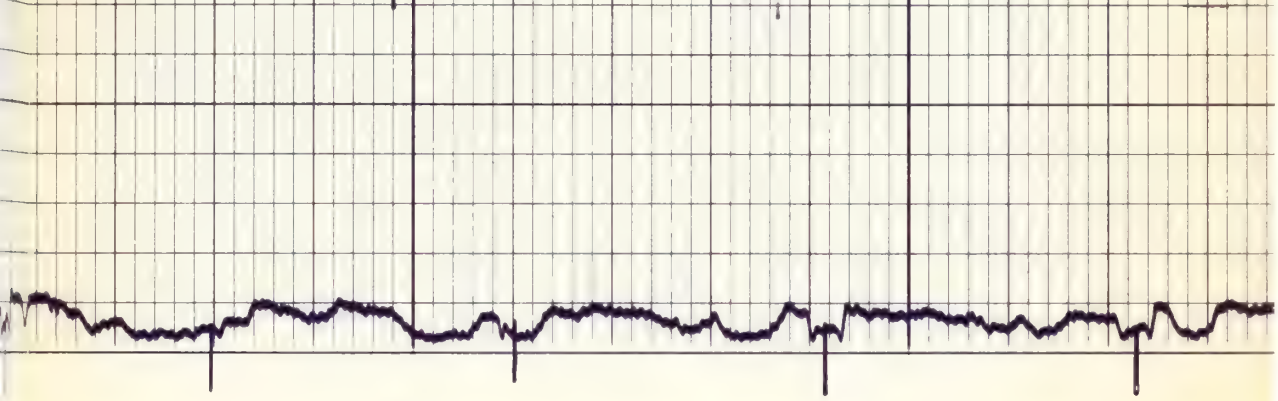
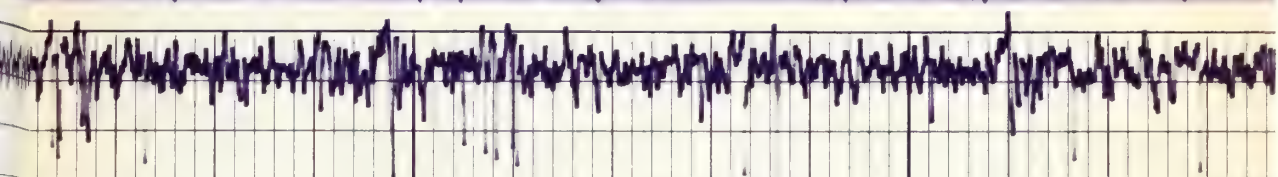
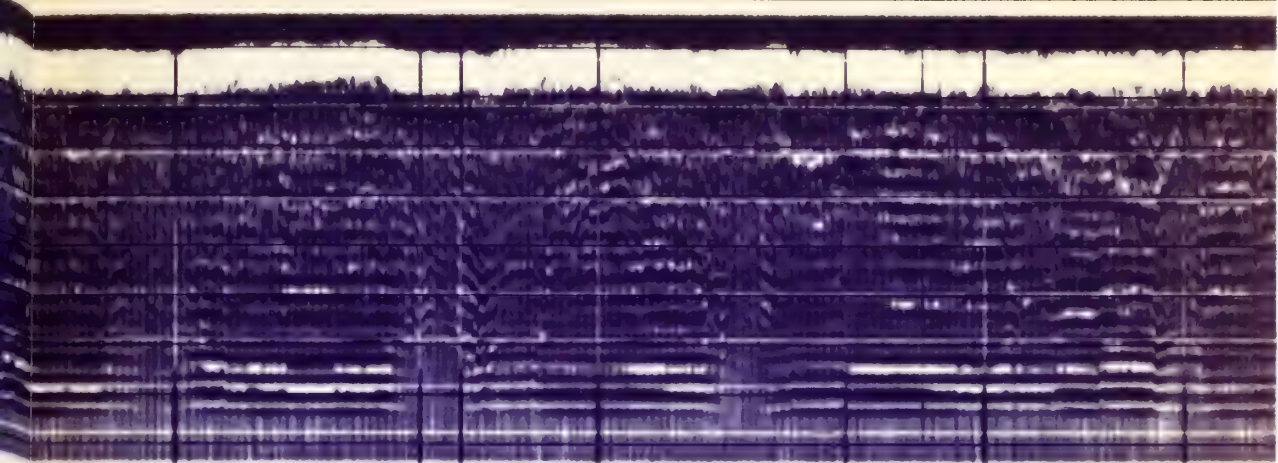
Casing Collars
Corrected Depth



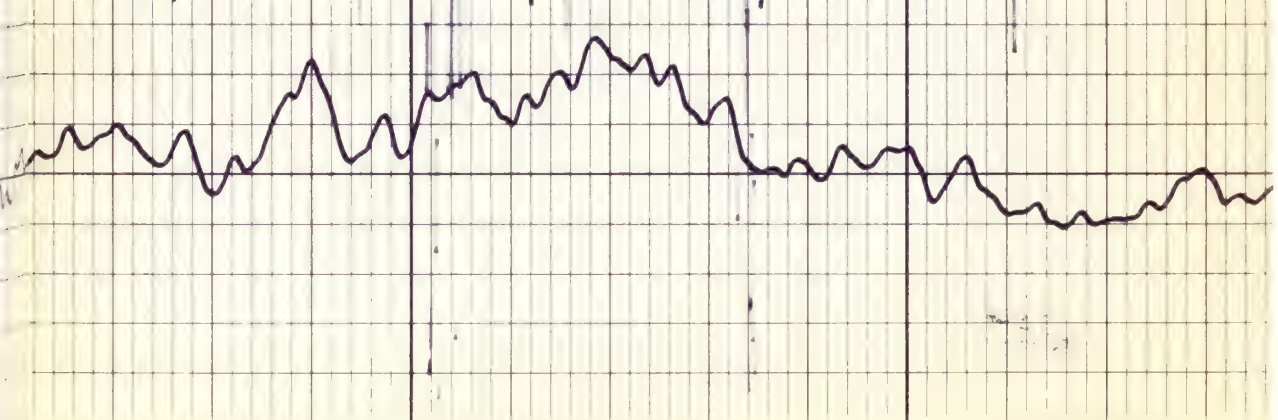
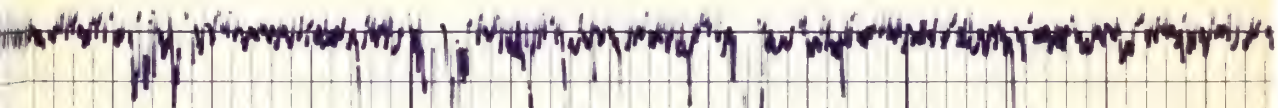


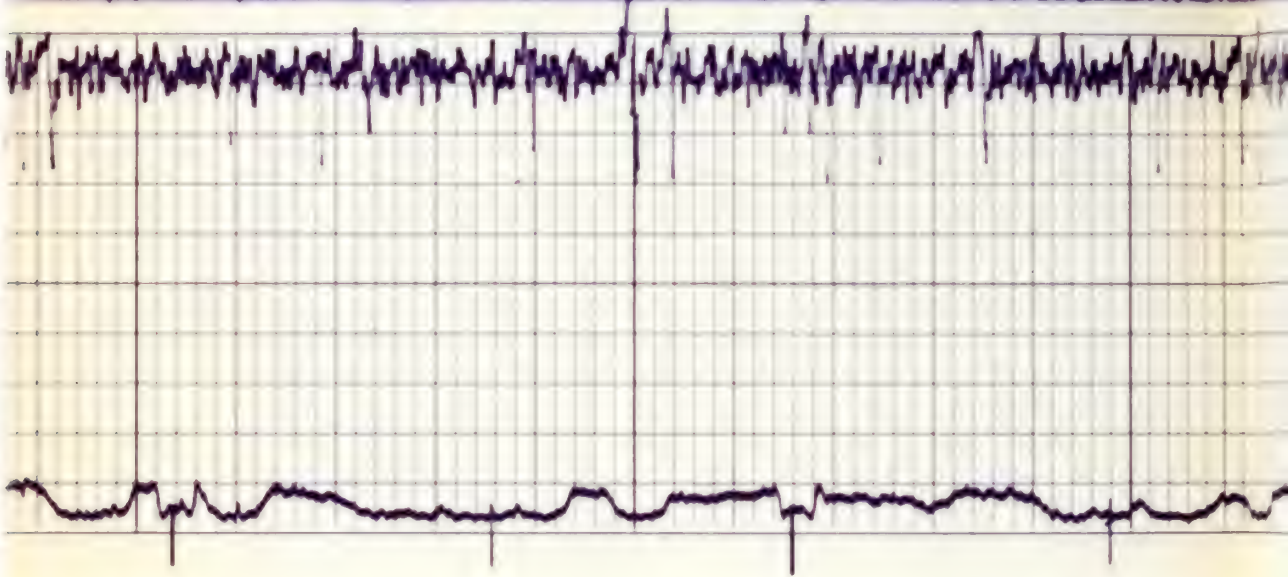
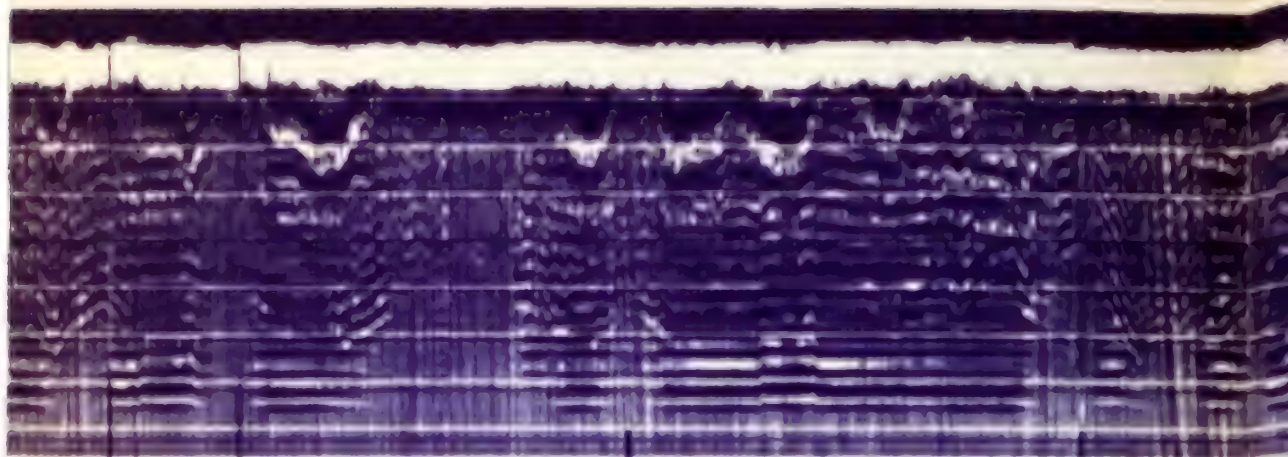
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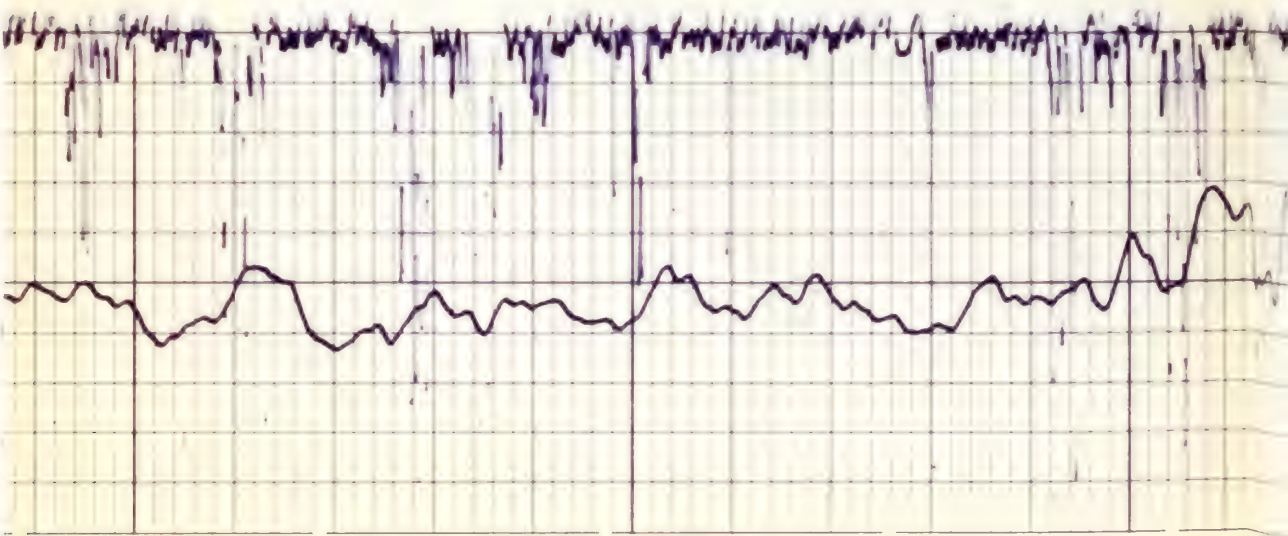
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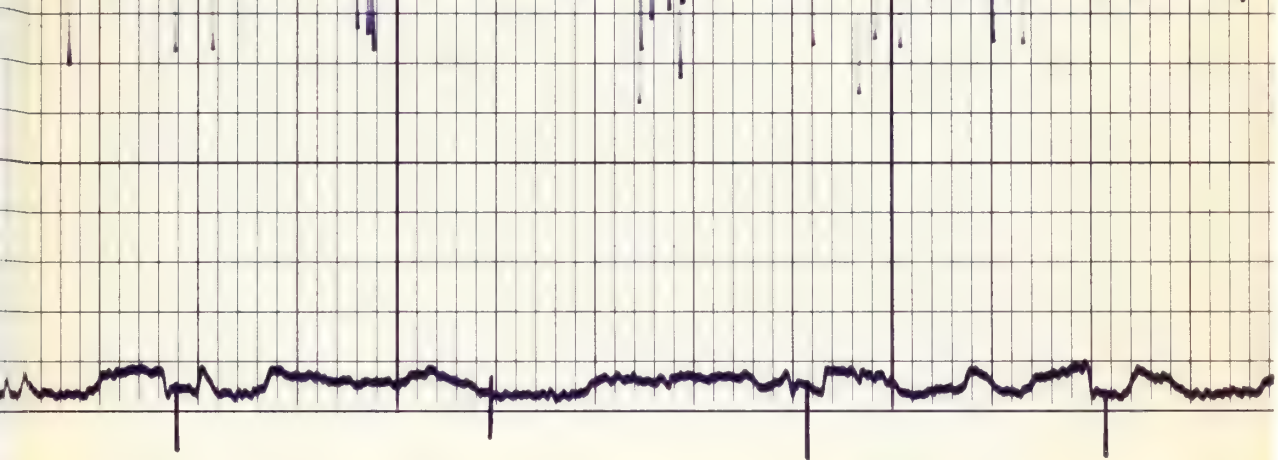
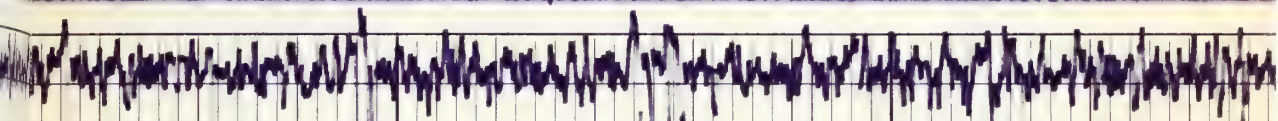
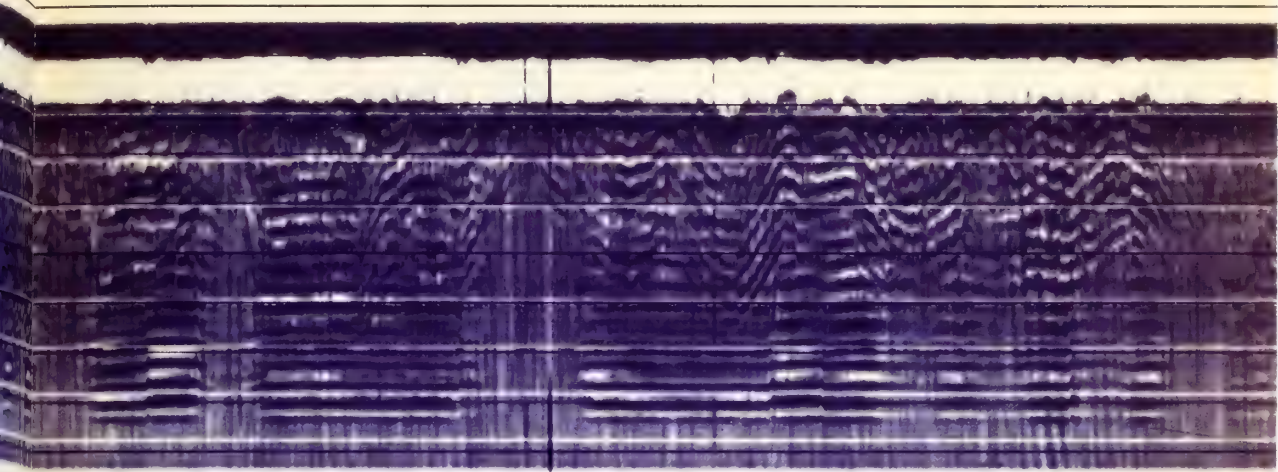




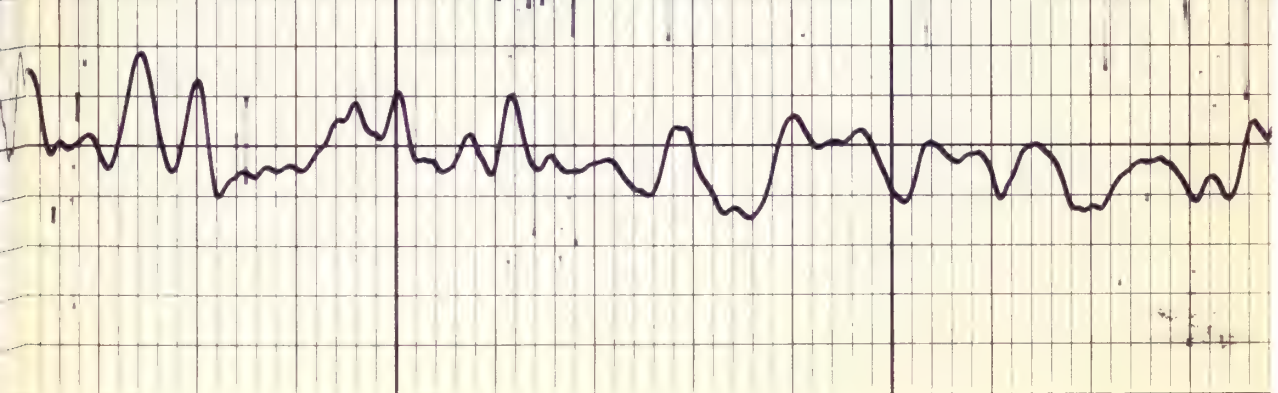
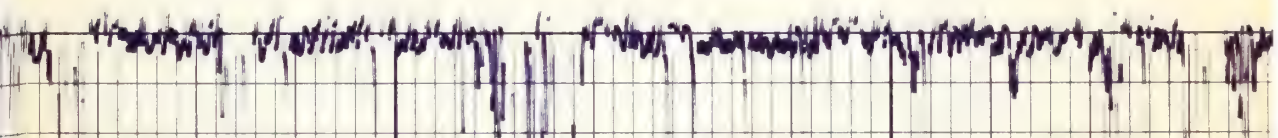
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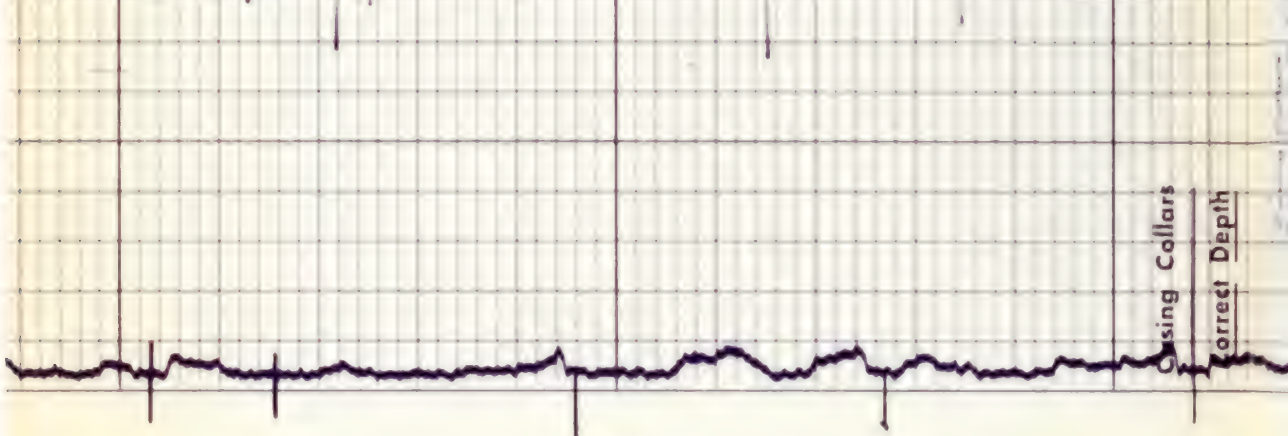
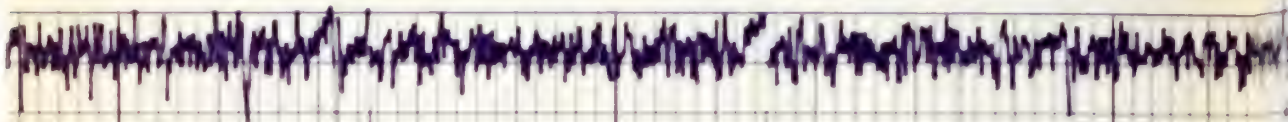
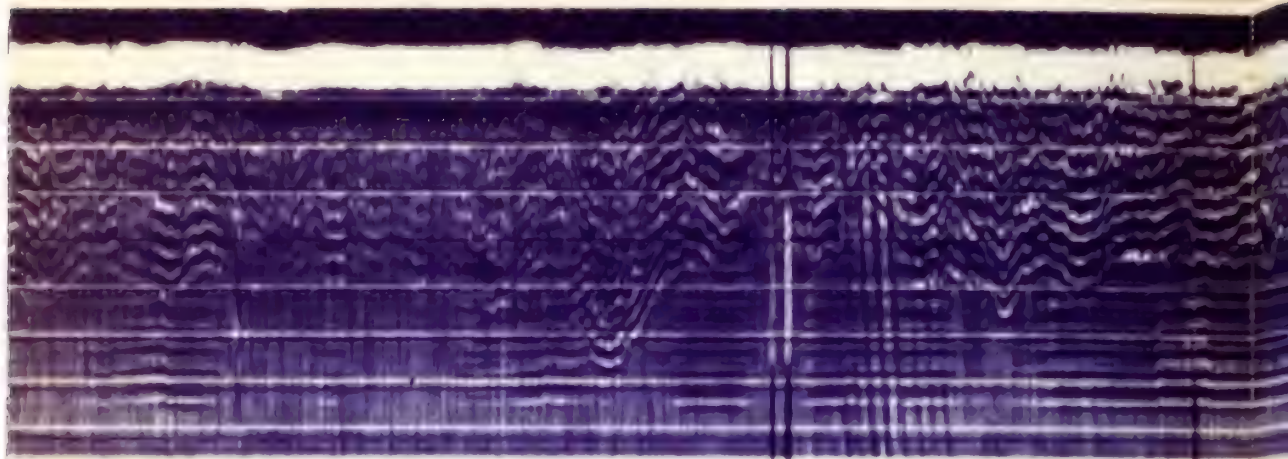
1300





1400

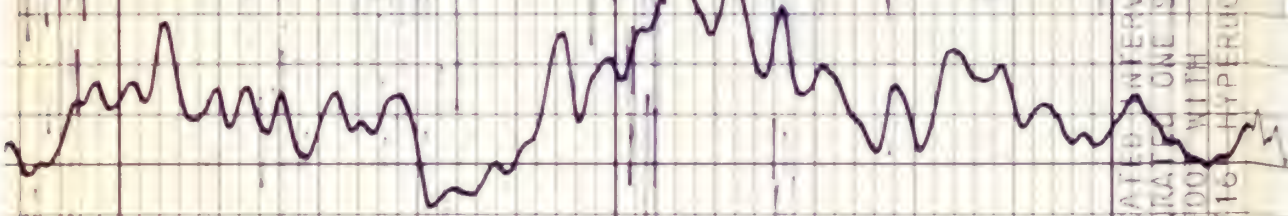




1500

Oasing Collars

Correct Depth

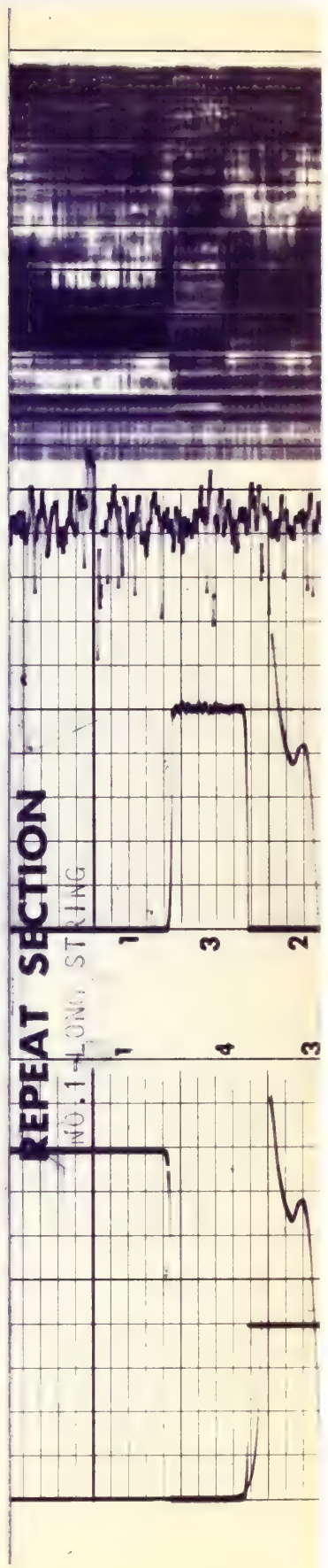
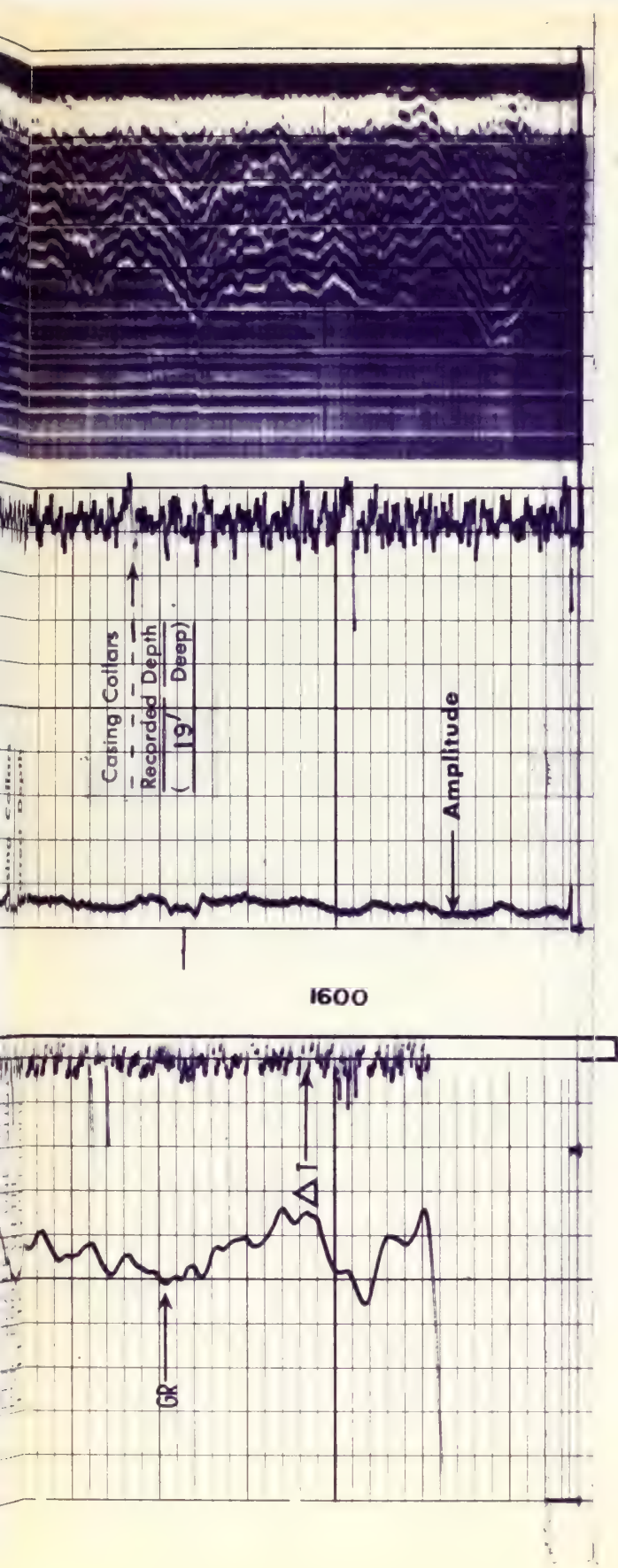


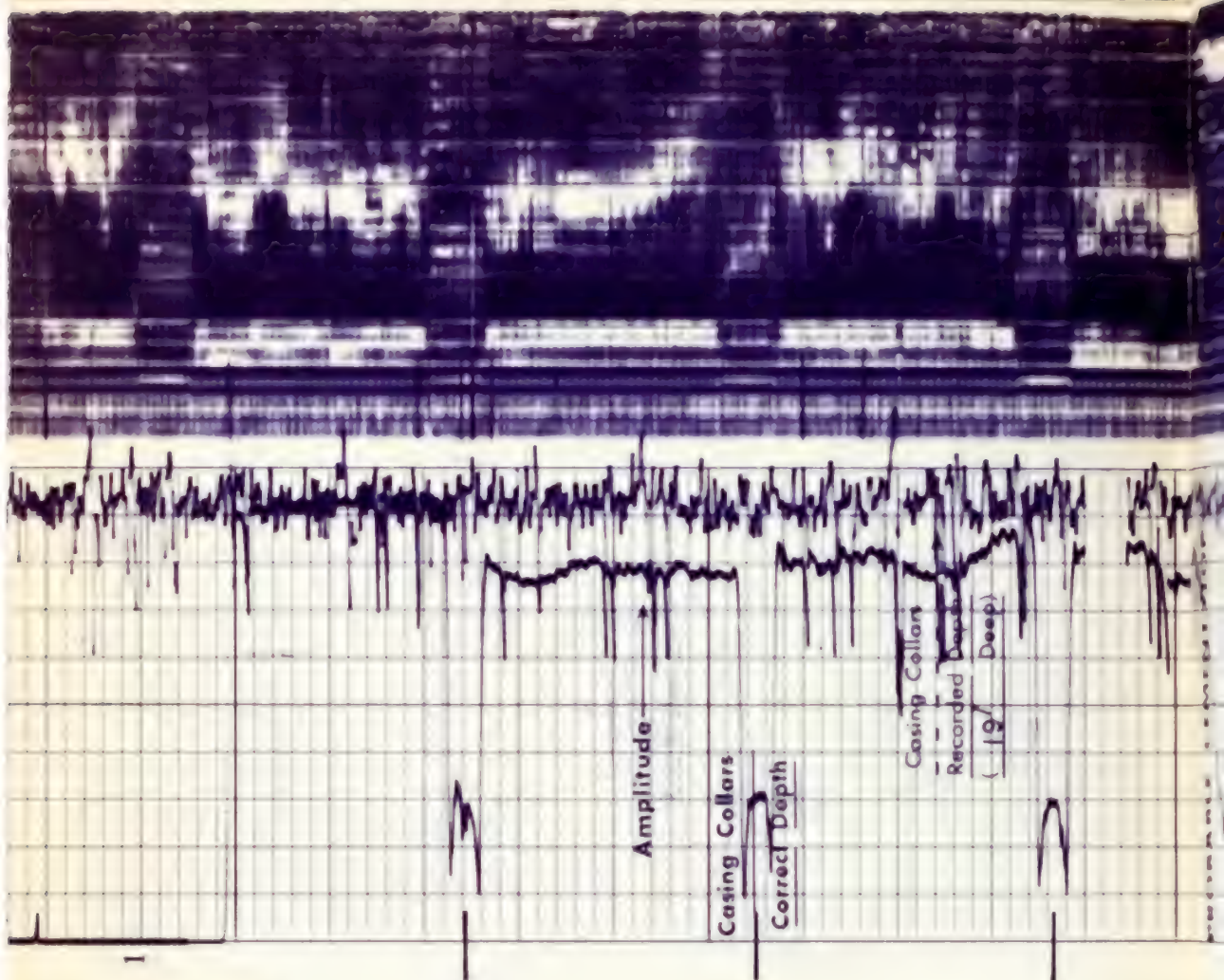
INDICATED INTERVAL

PERFORATED ONE SHOT

PIF 800 WITH

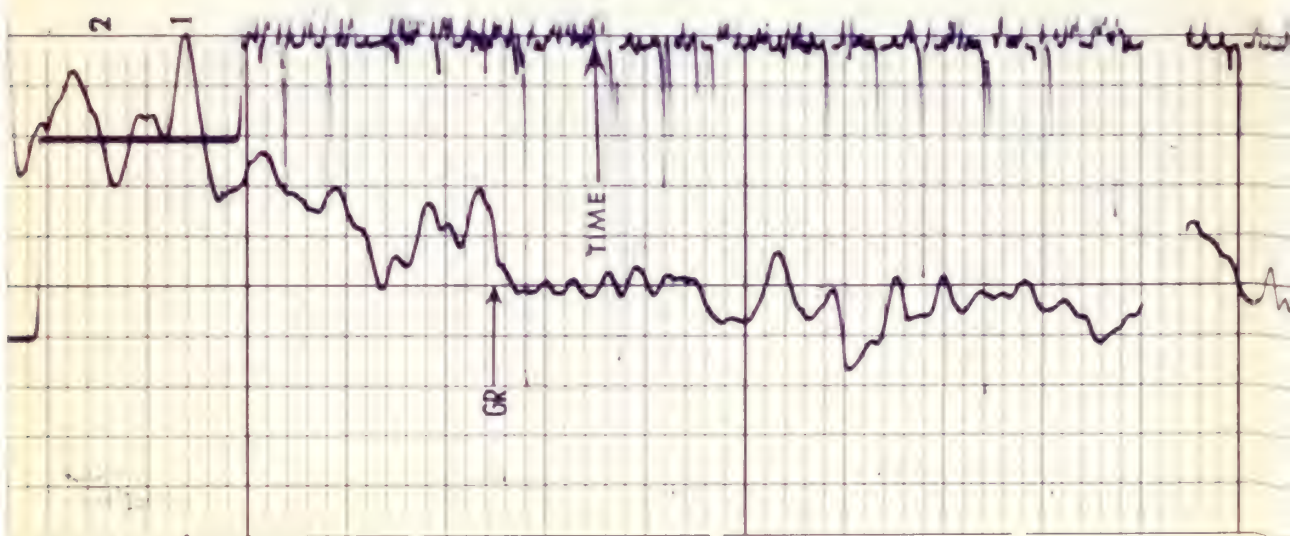
1 11/16 HYPERHOME

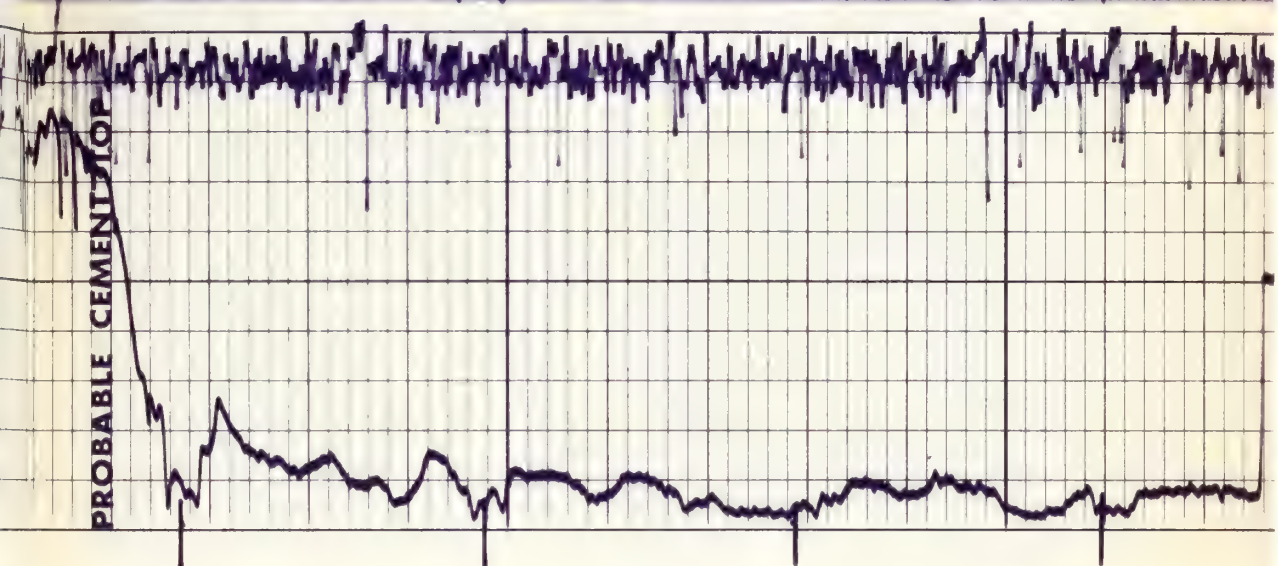
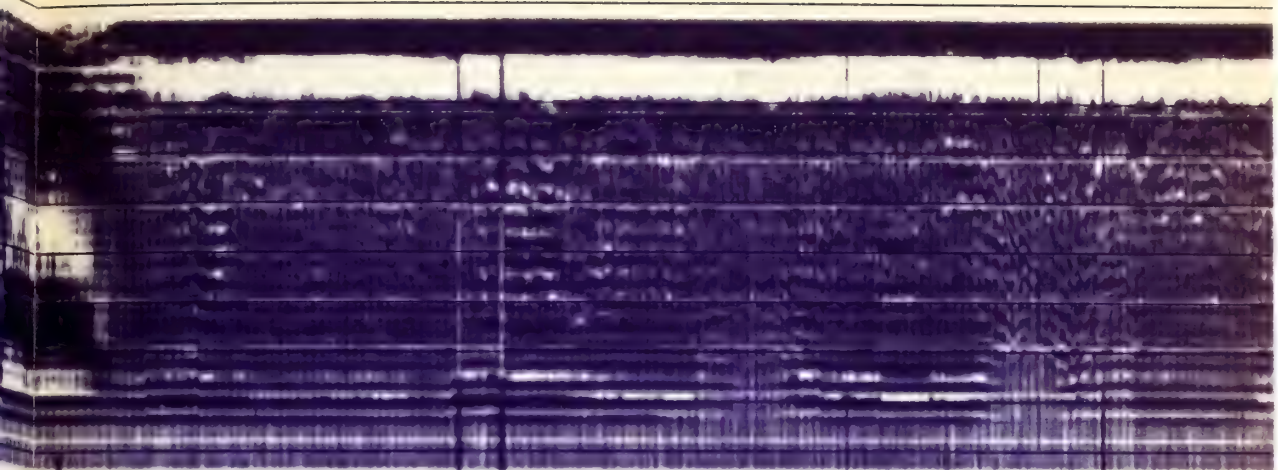




0900

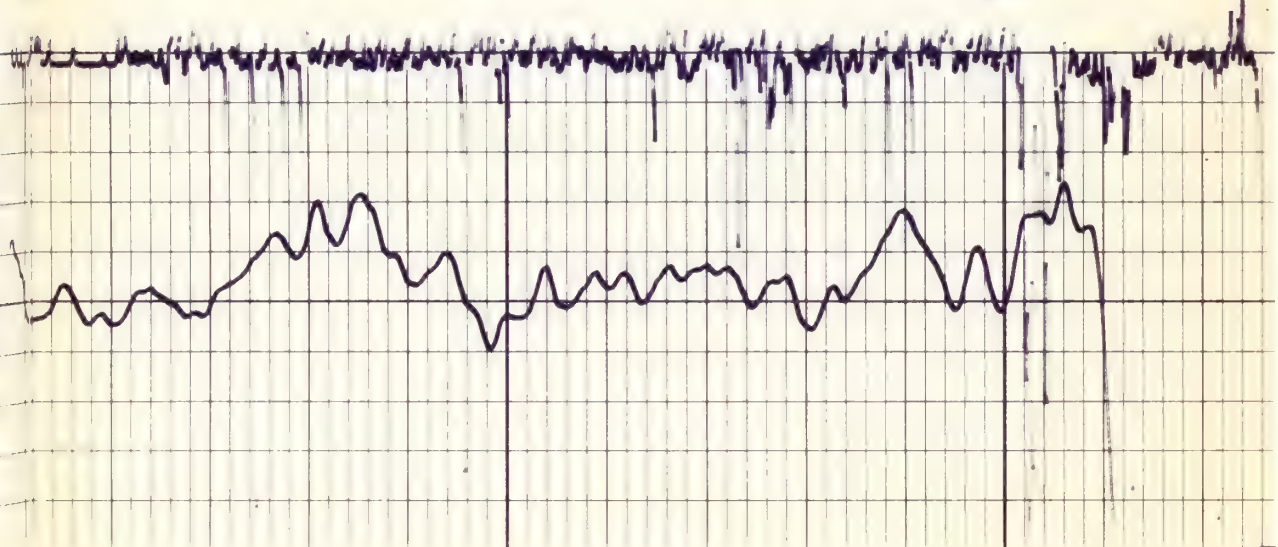
1000

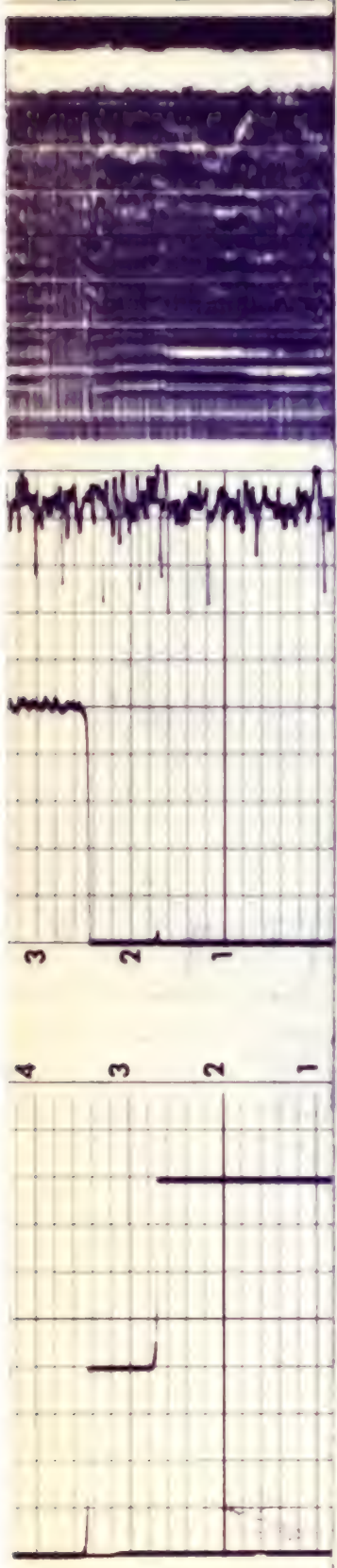




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1100



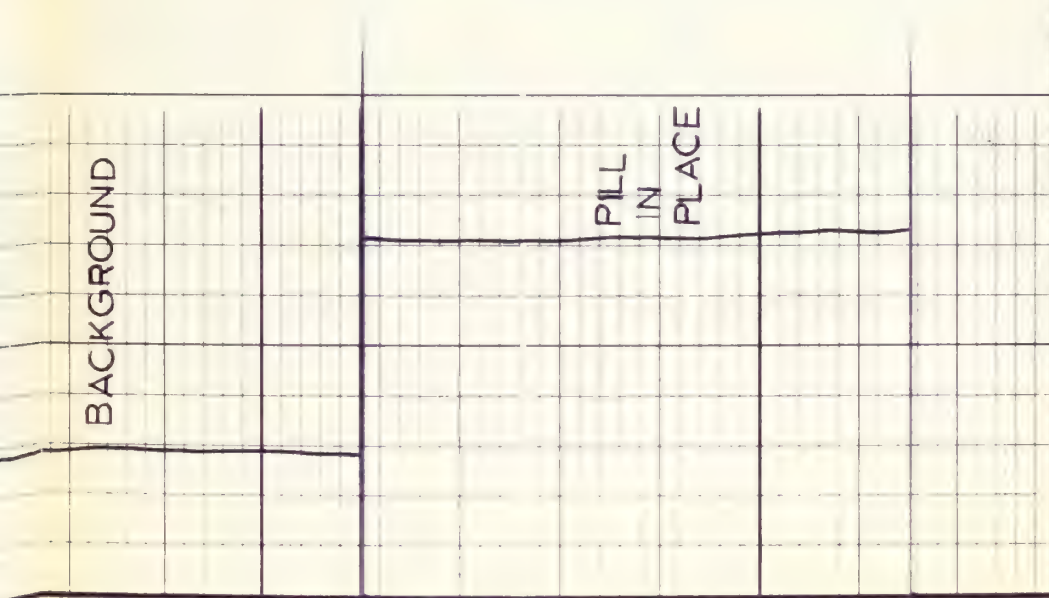
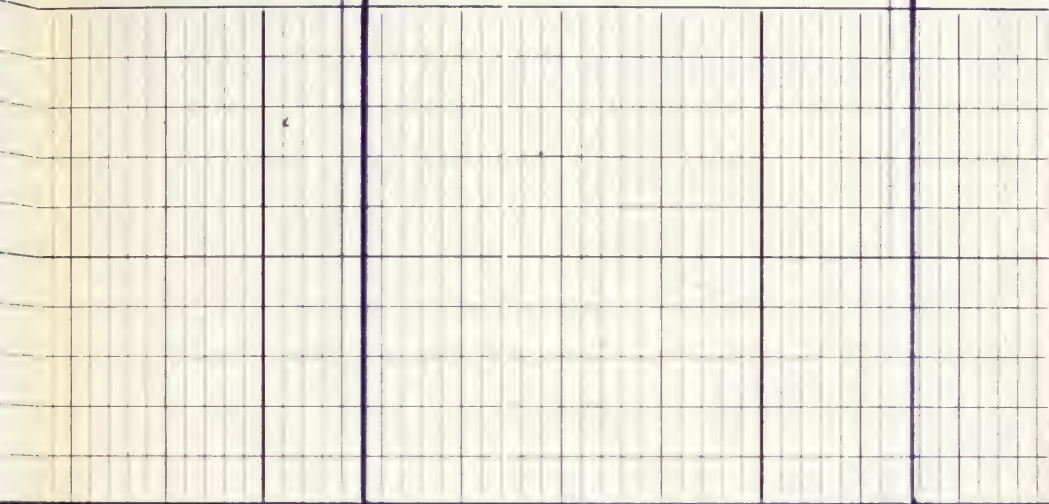
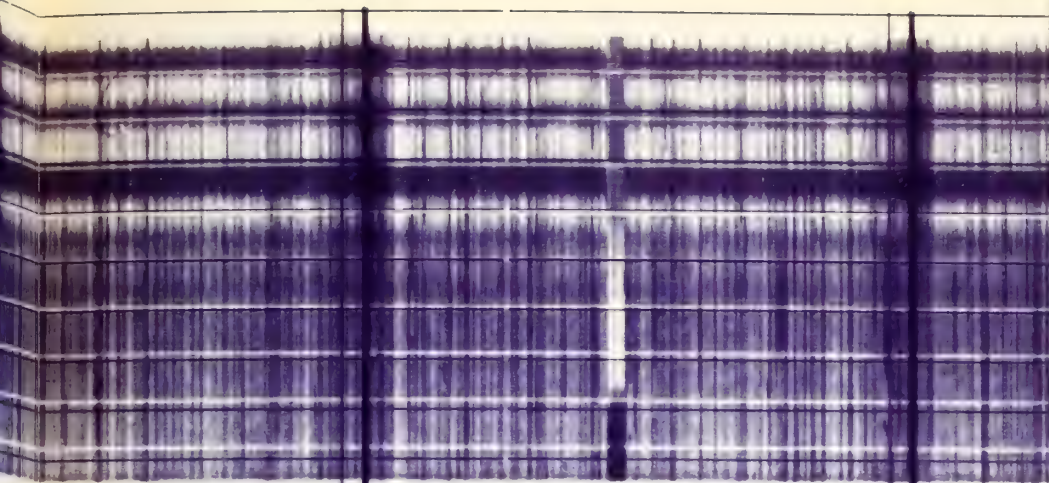


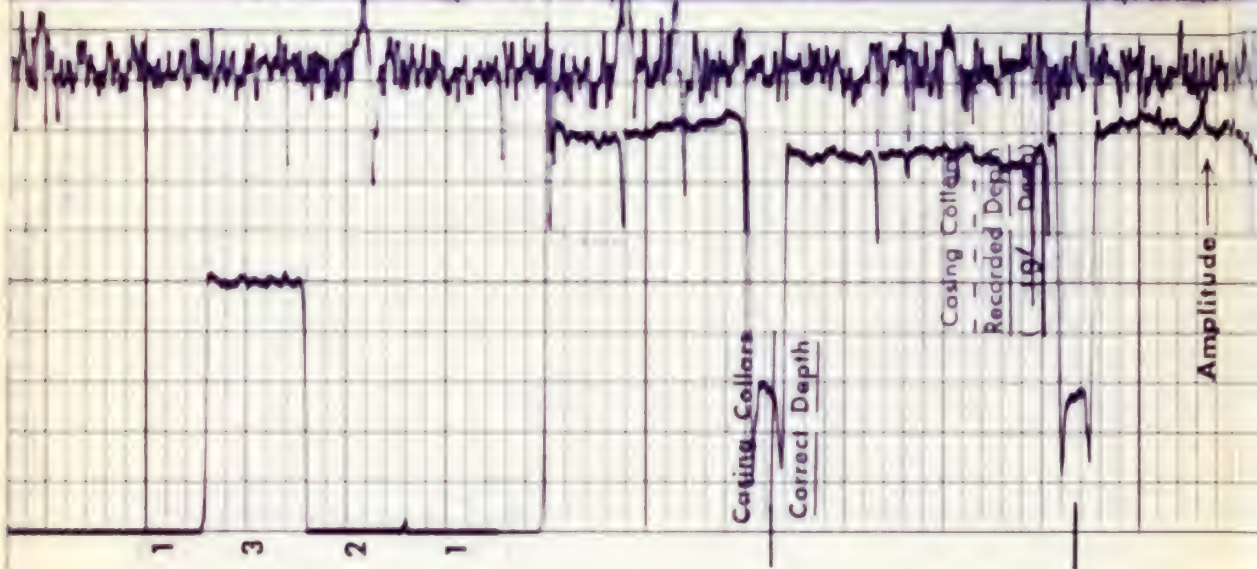
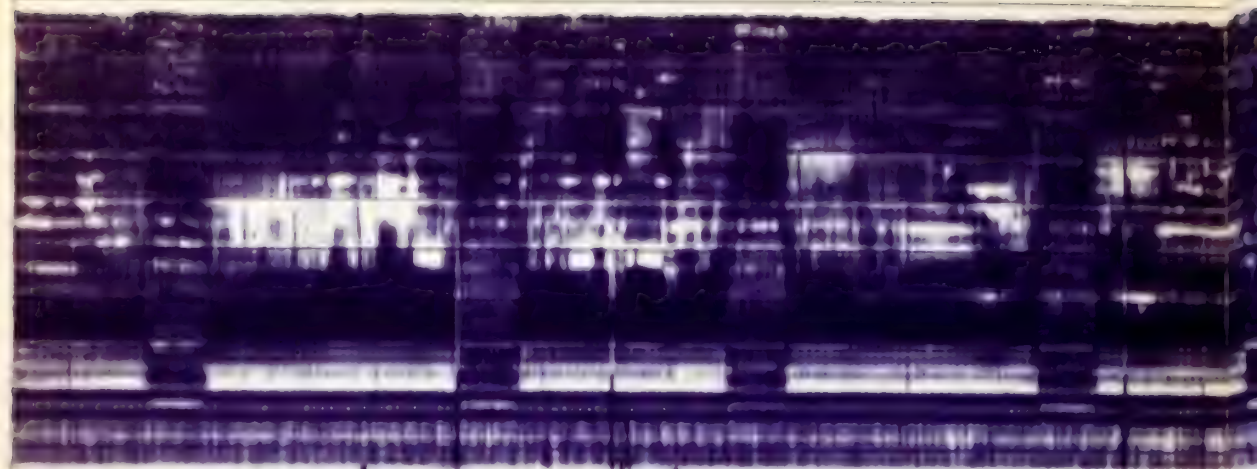
GP CALIBRATION
BEFORE SURVEY

Mech. Zero

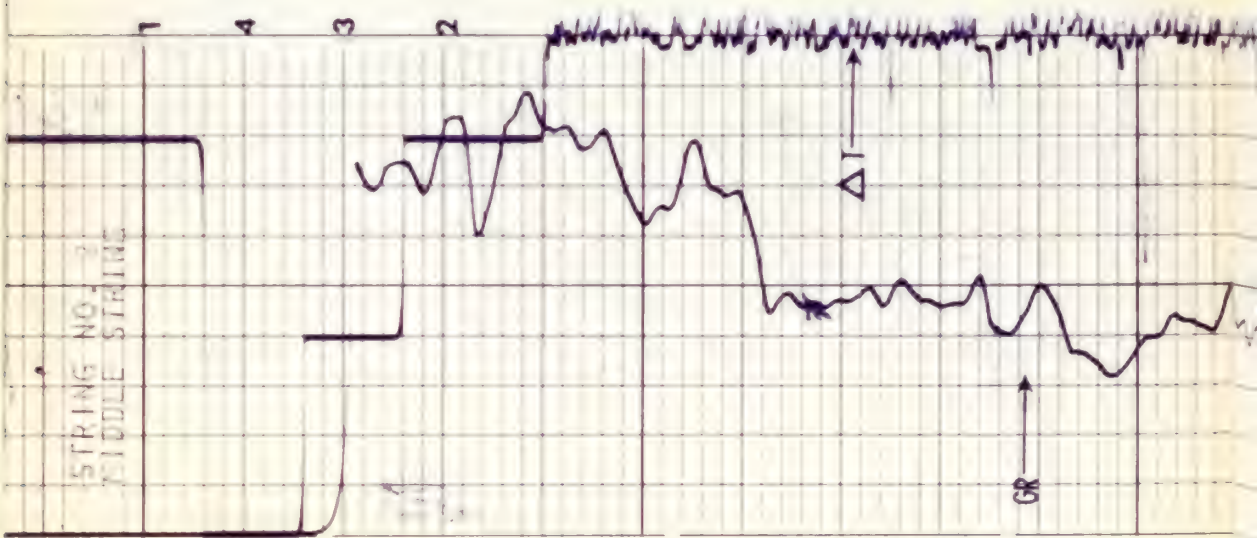
BACKGROUND

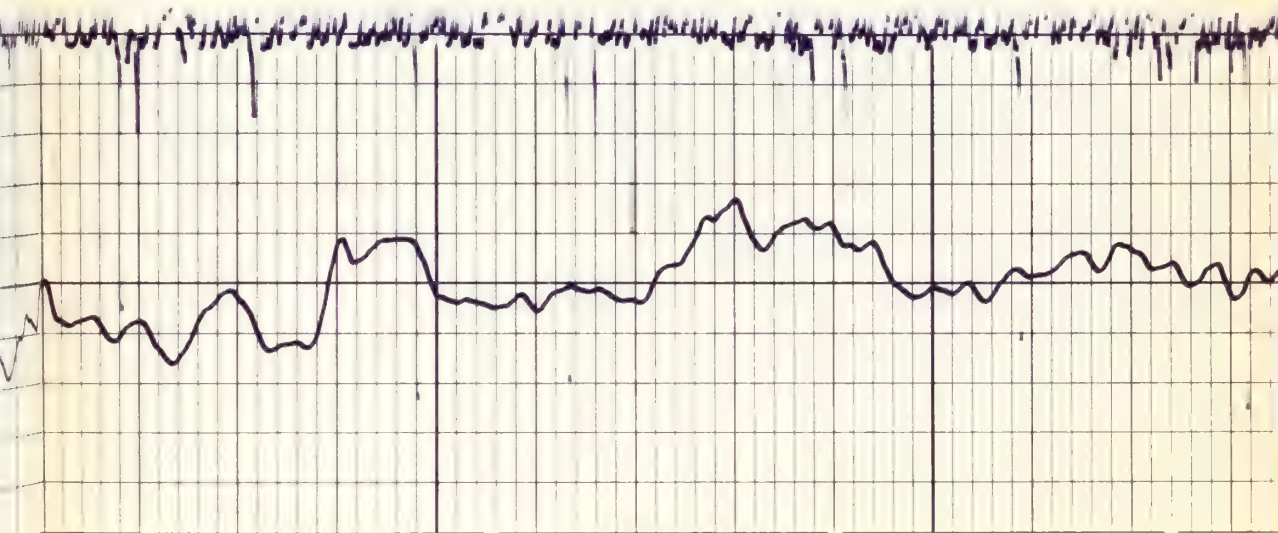
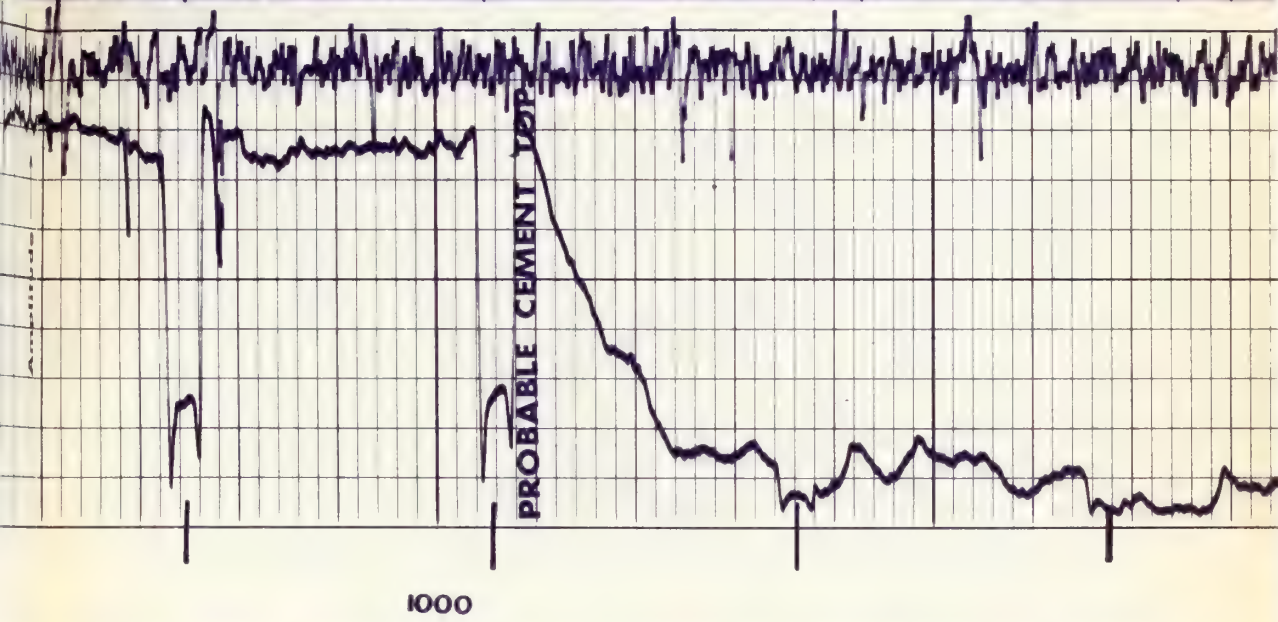
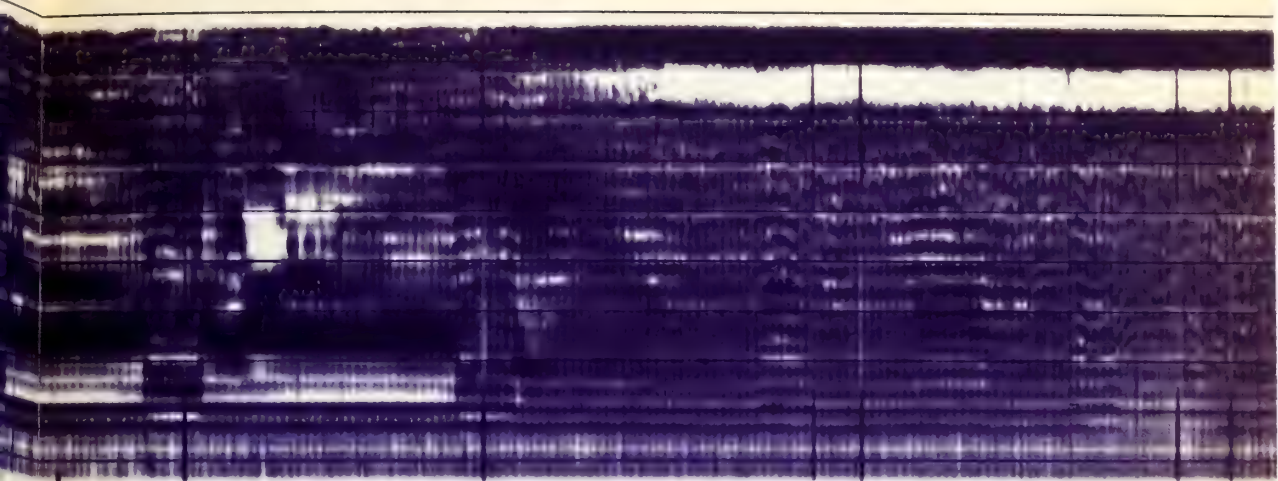
PILL
IN
PLACE

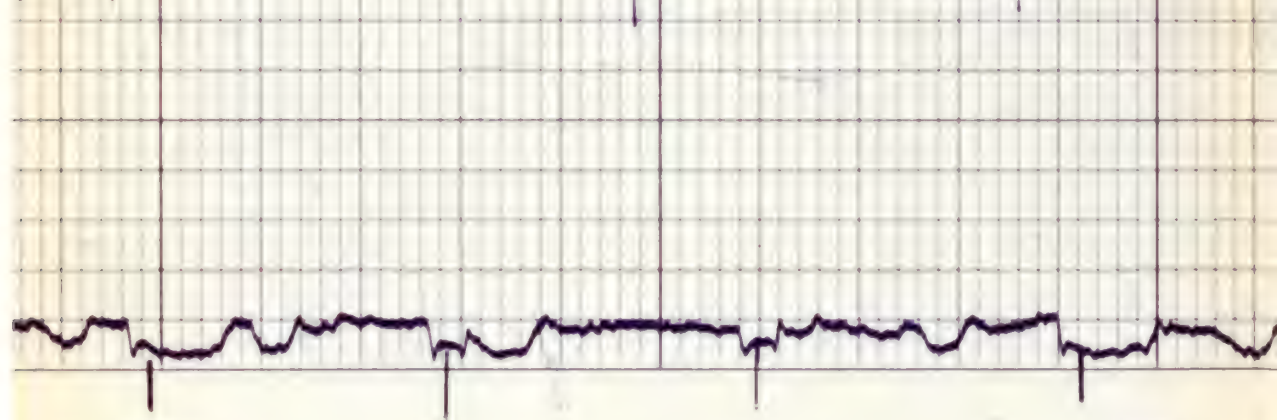
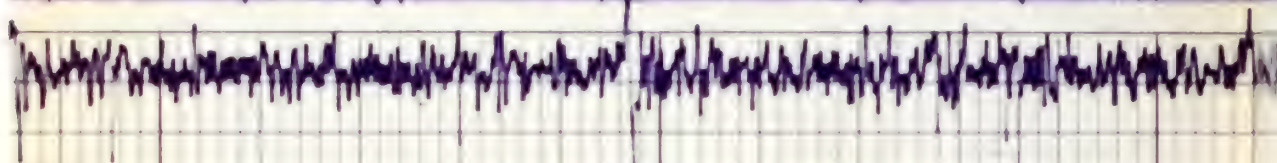
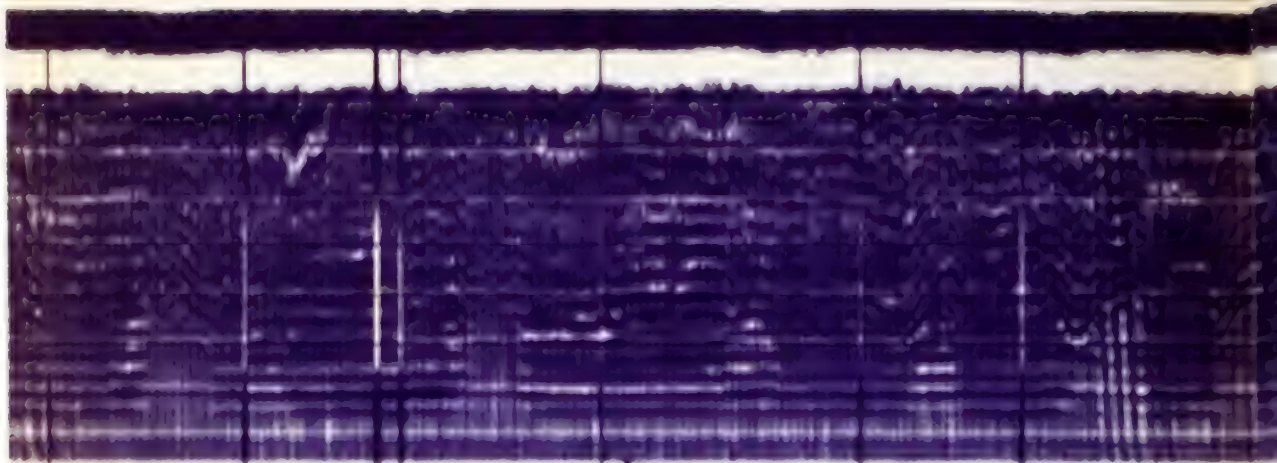




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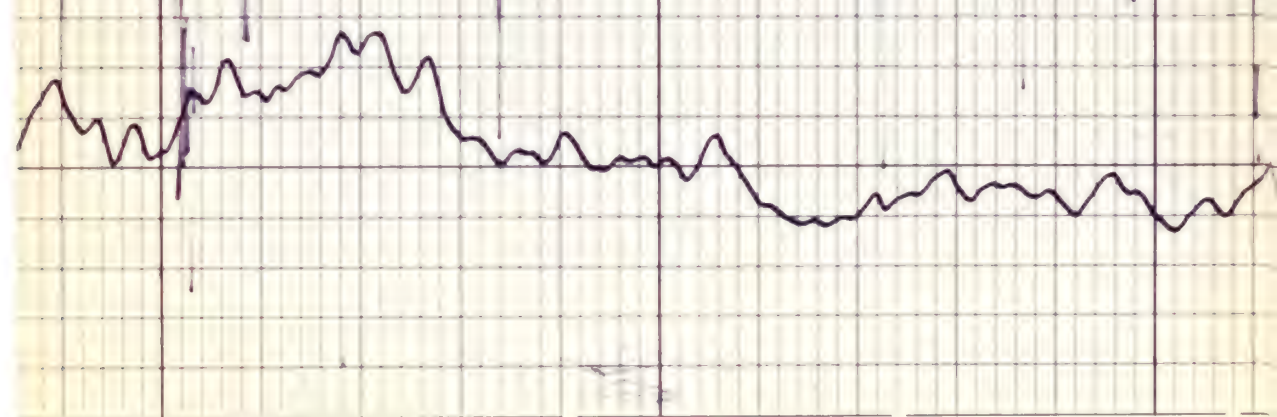
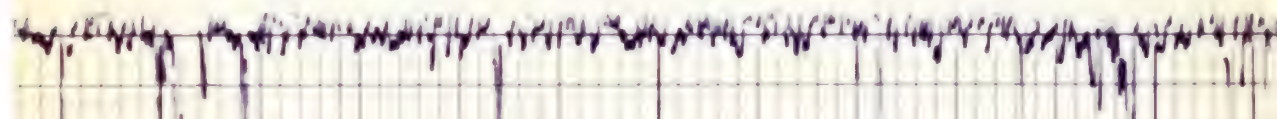


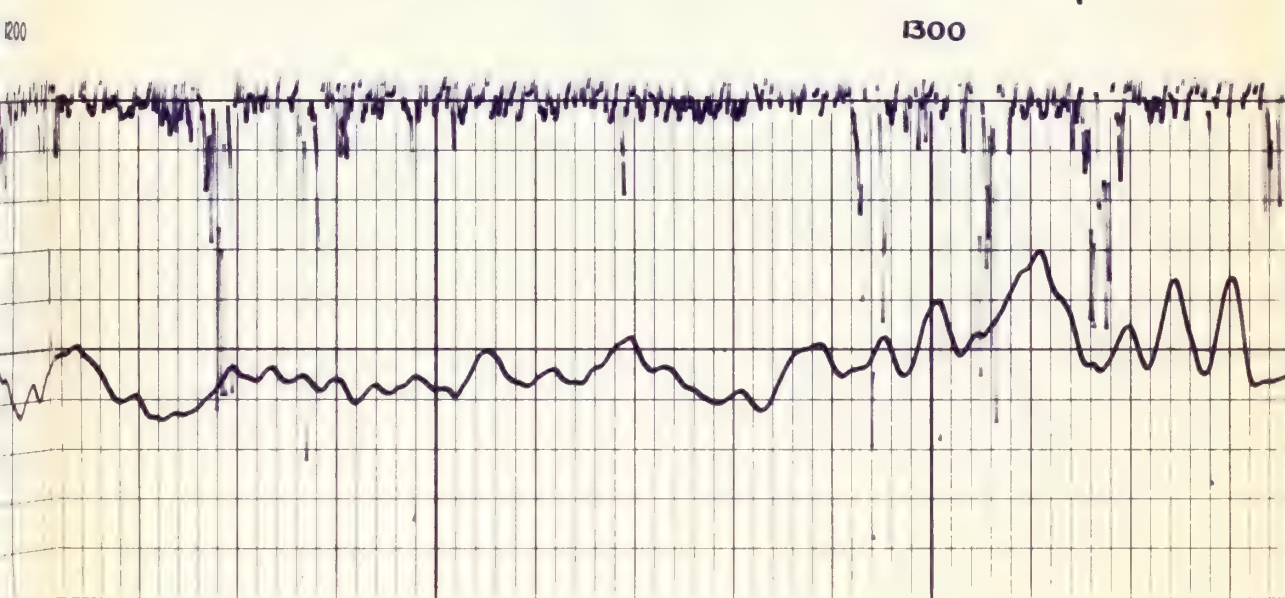
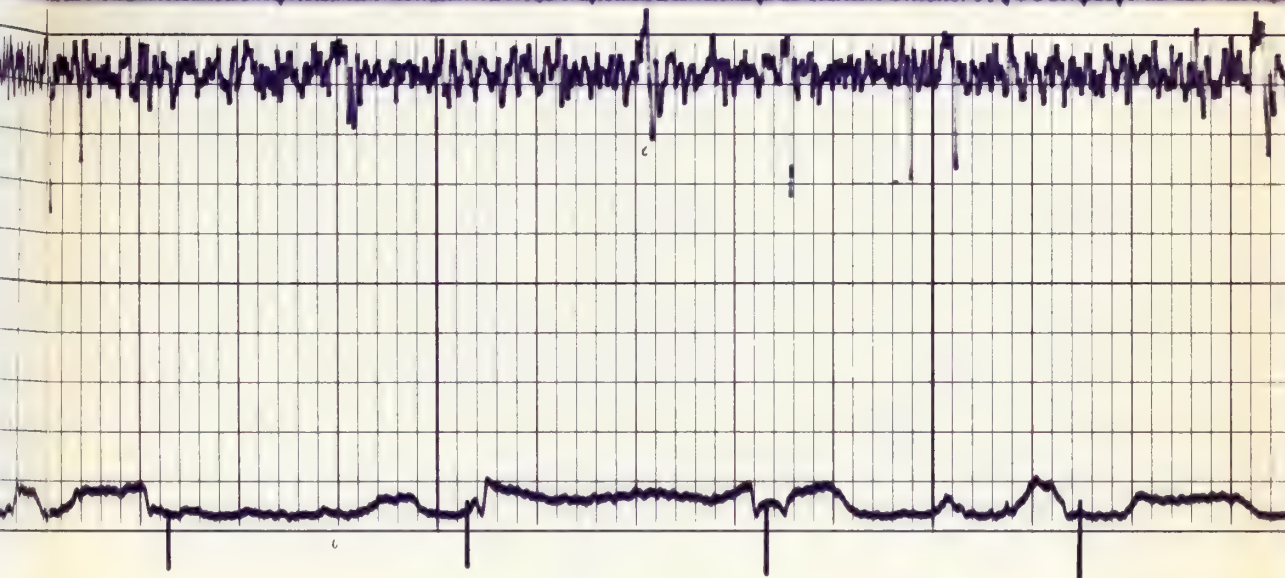
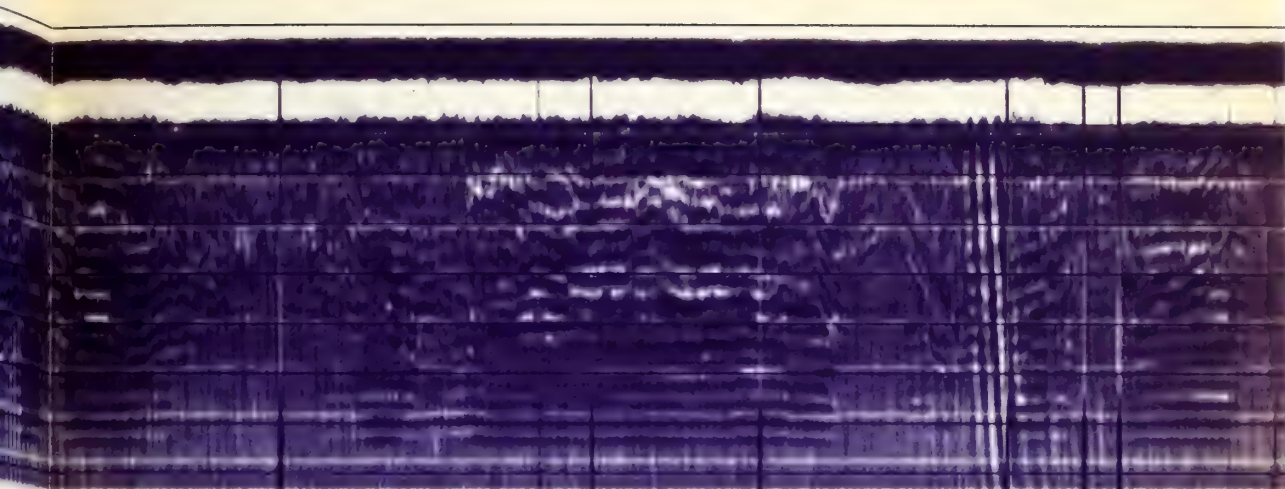


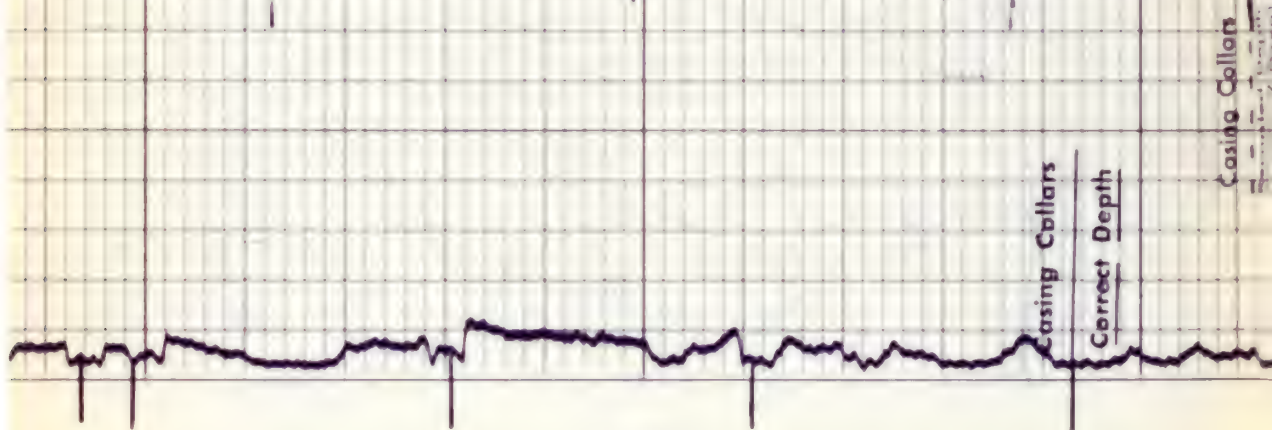
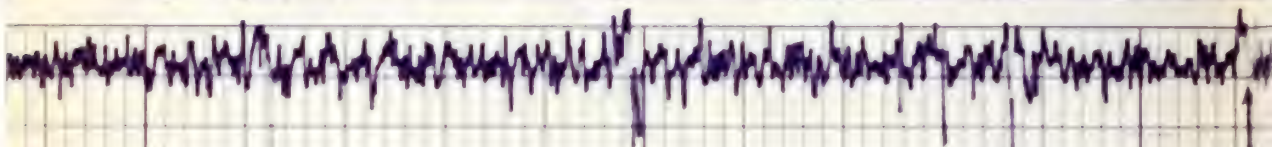
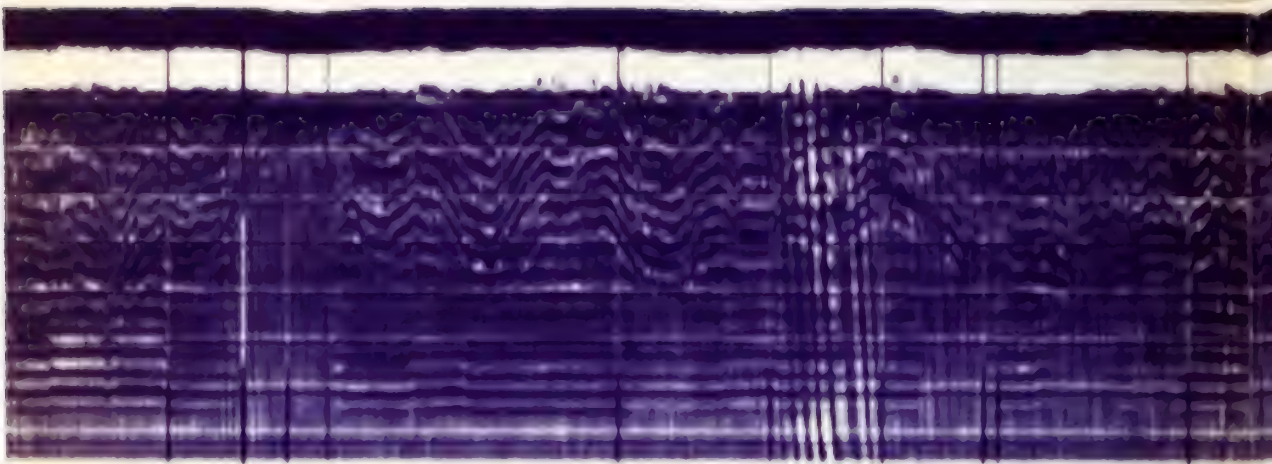


1100

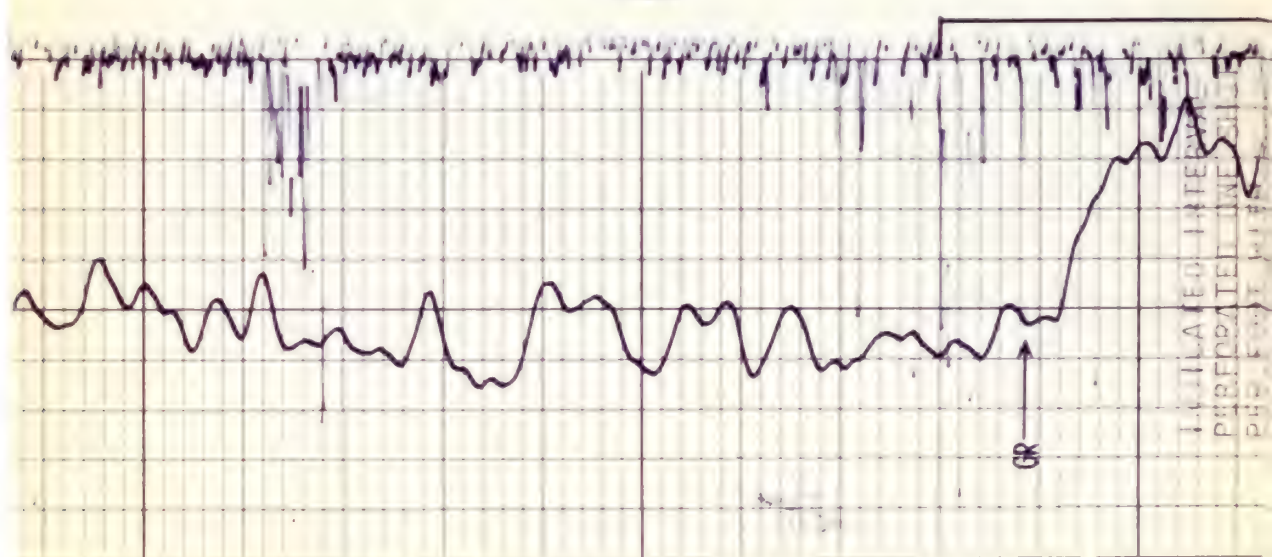
1200







1400

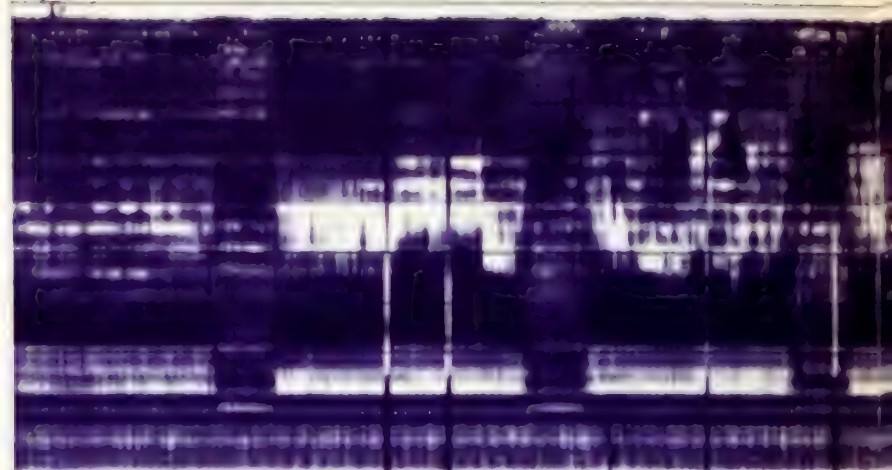
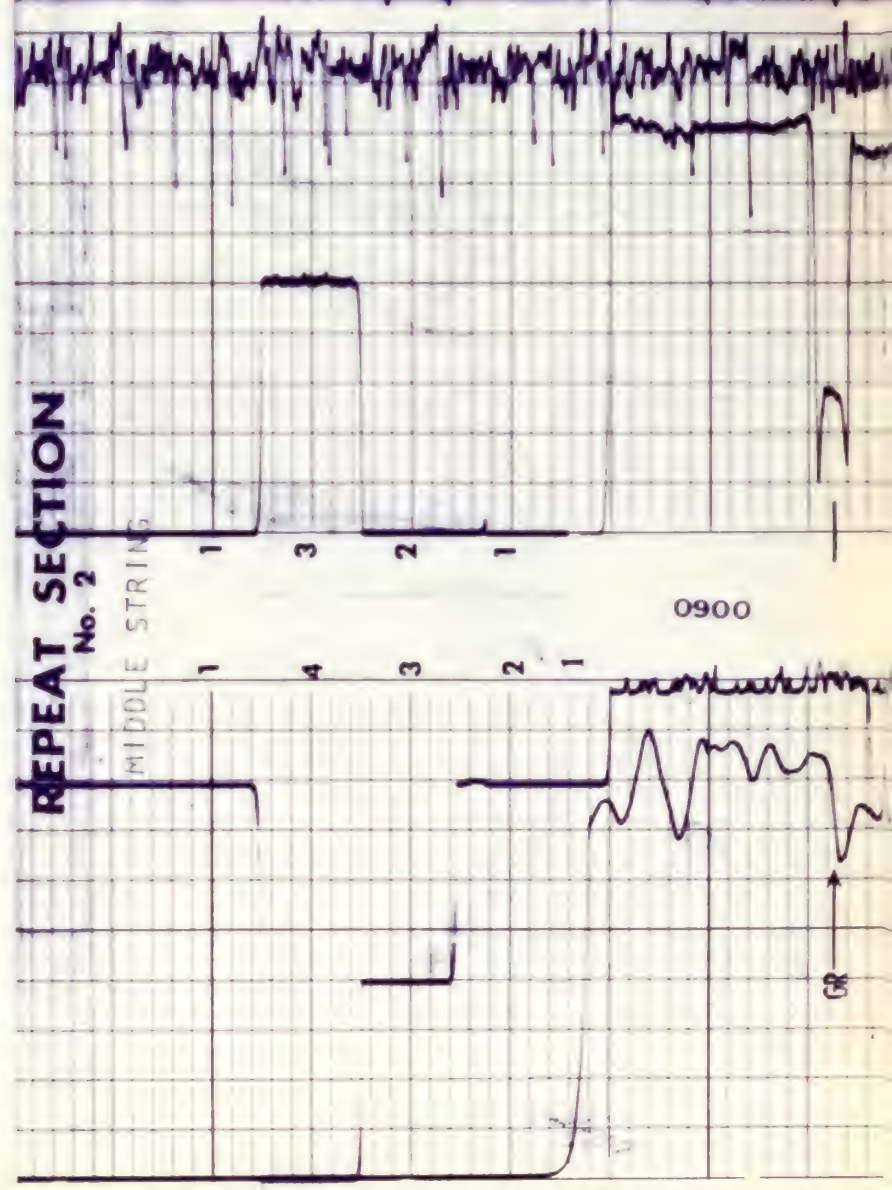


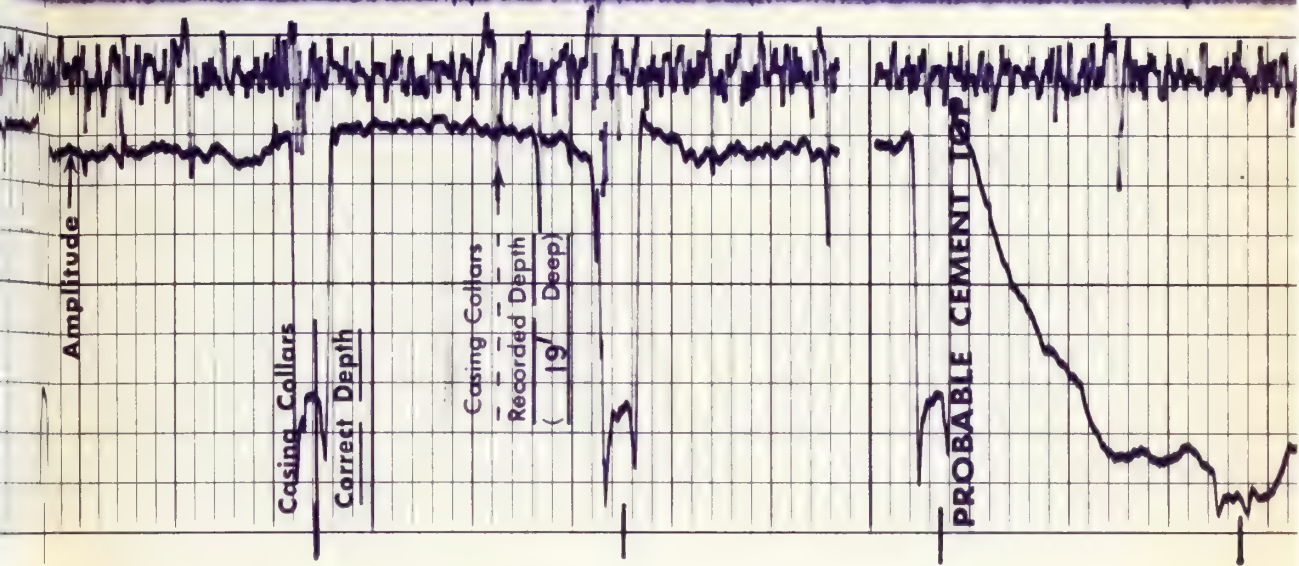
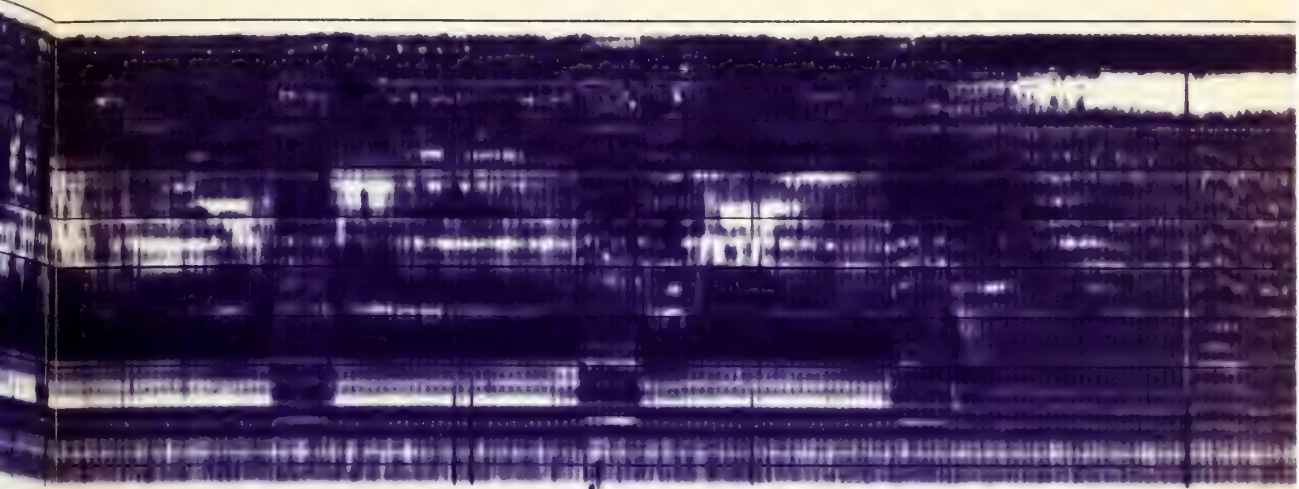
REPEAT SECTION
No. 2

MIDDLE STRING

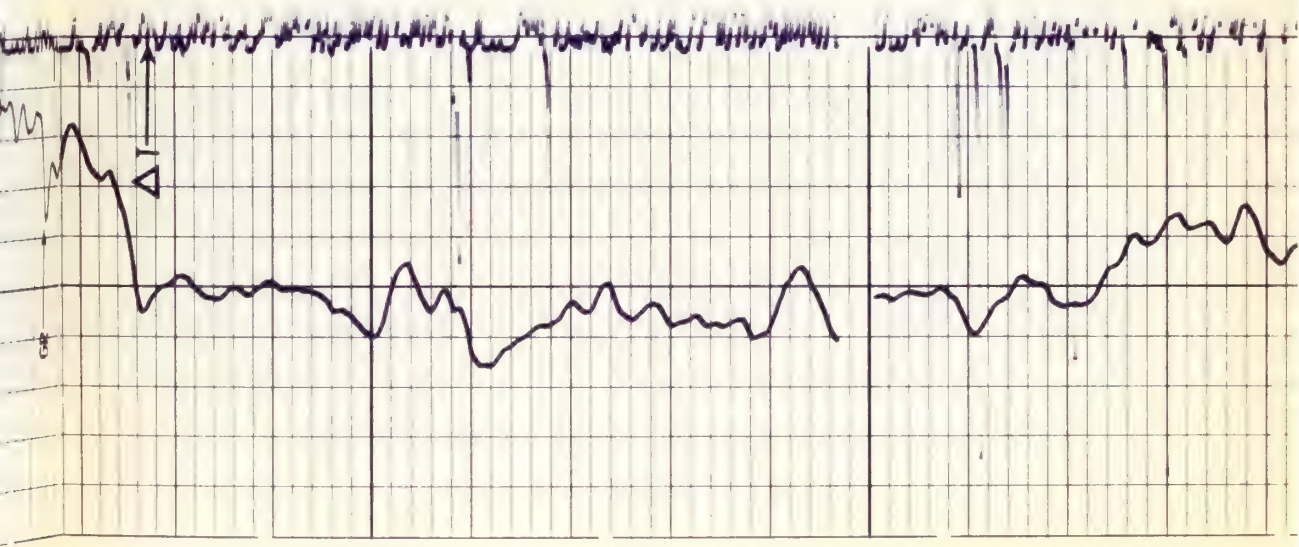
0900

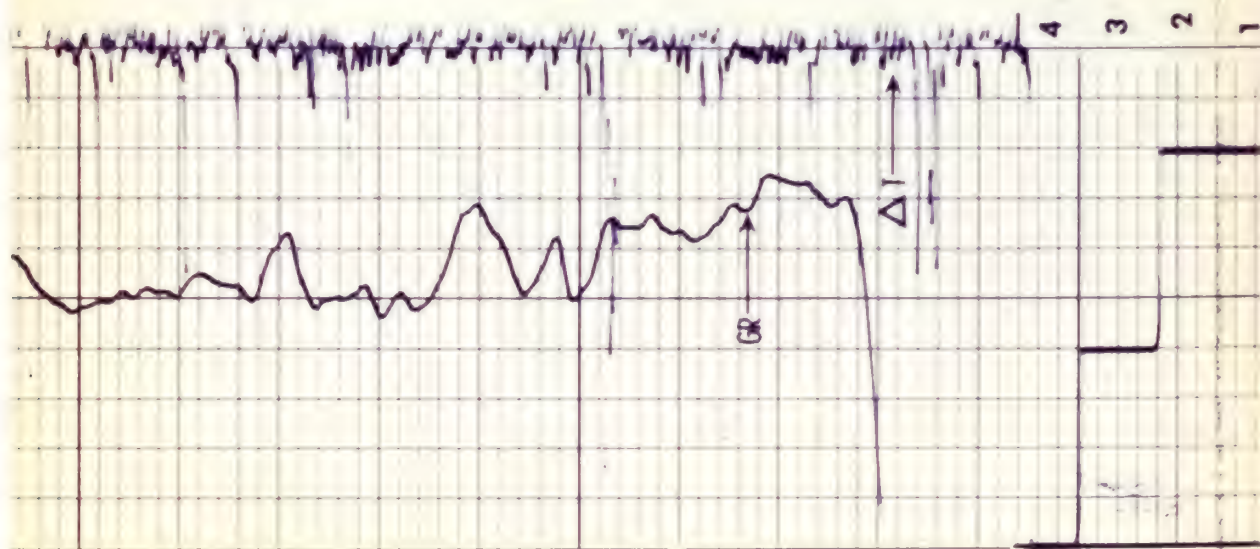
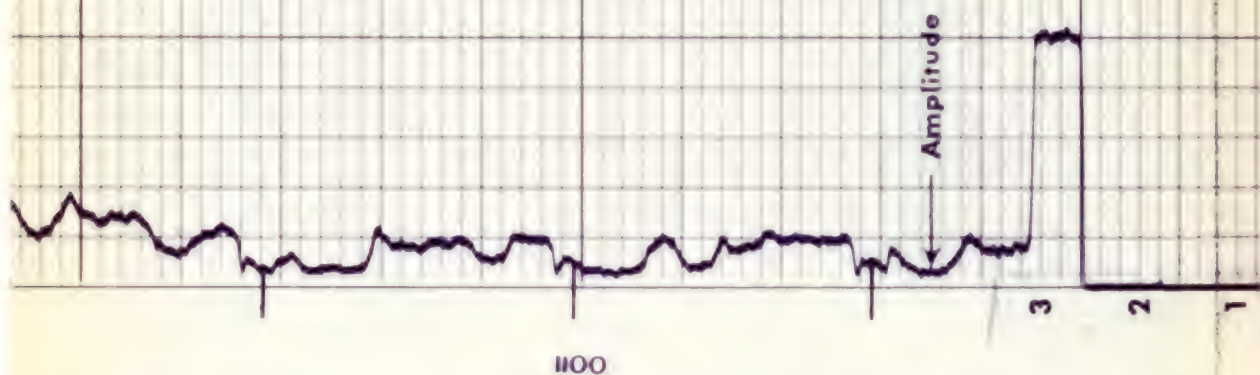
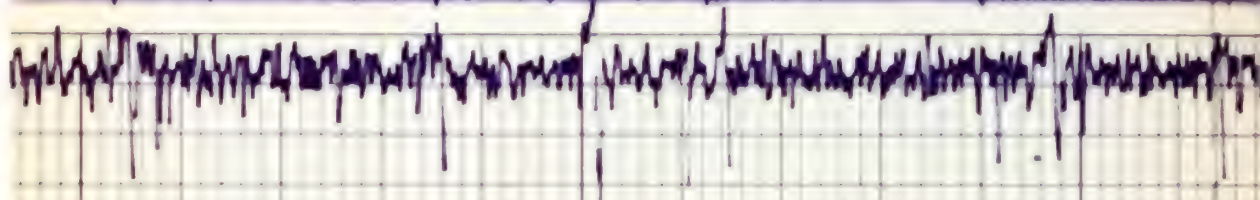
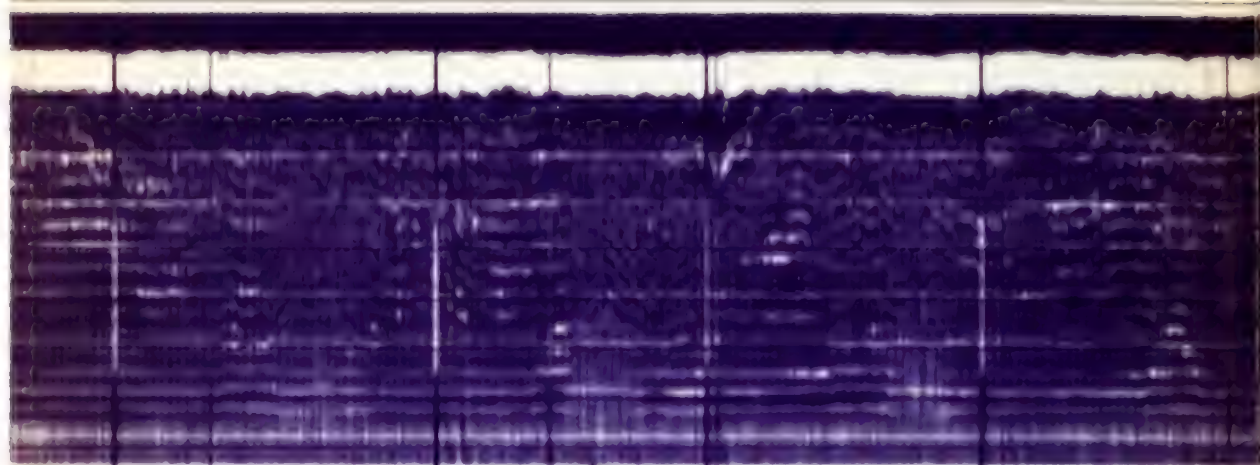
CR

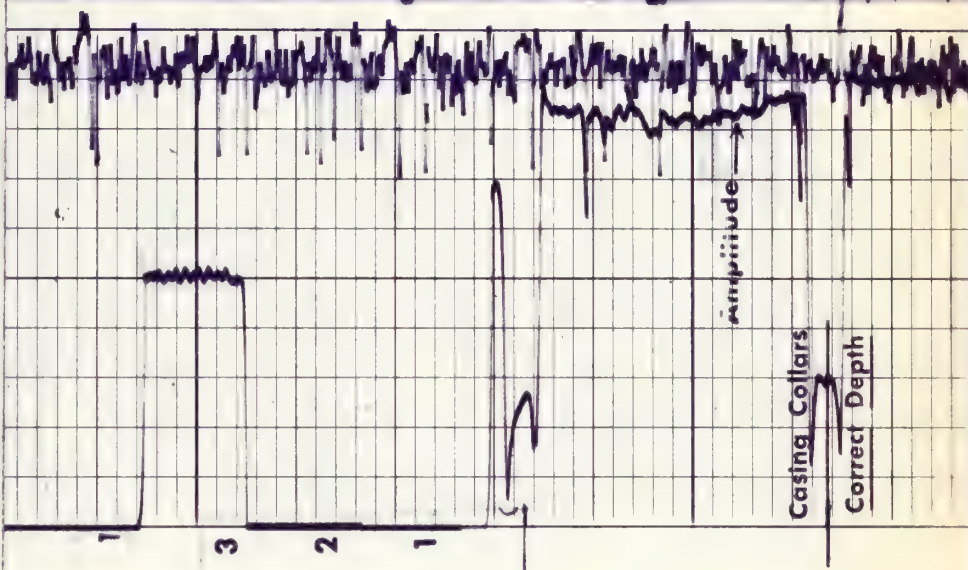
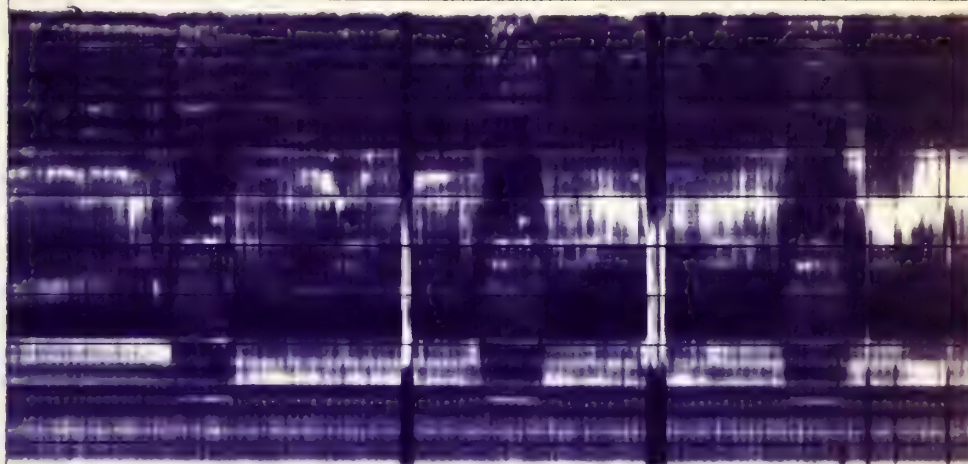




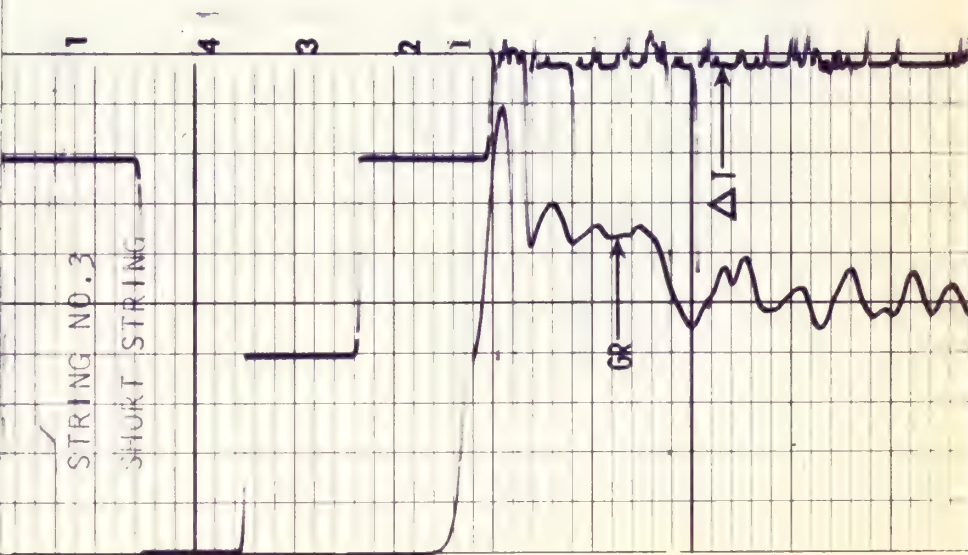
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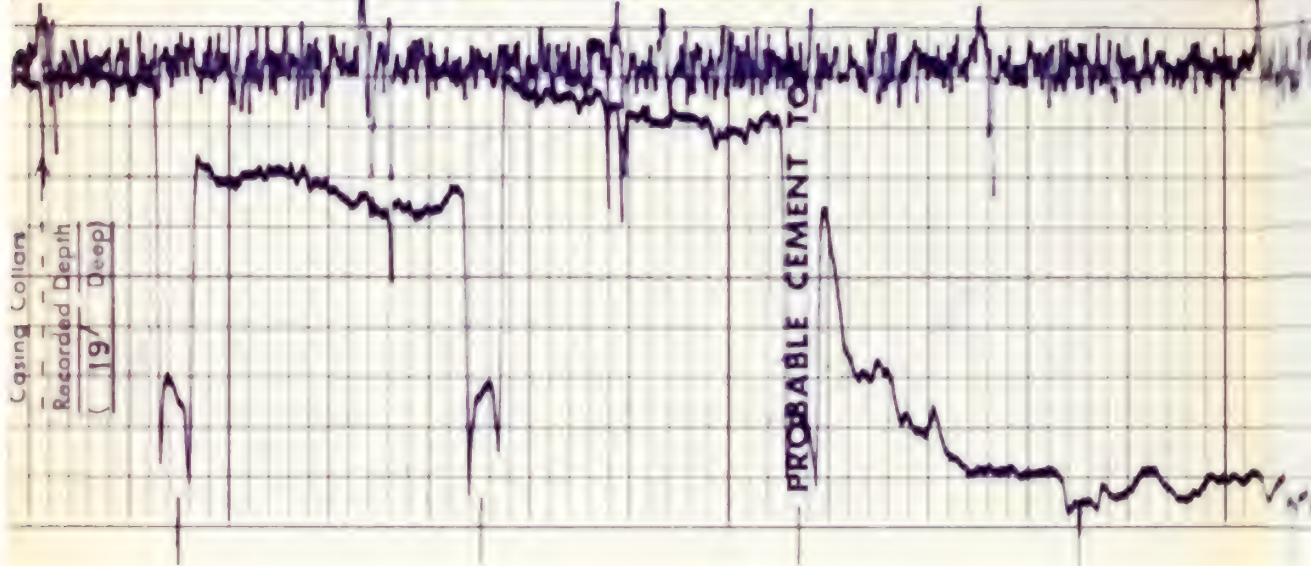
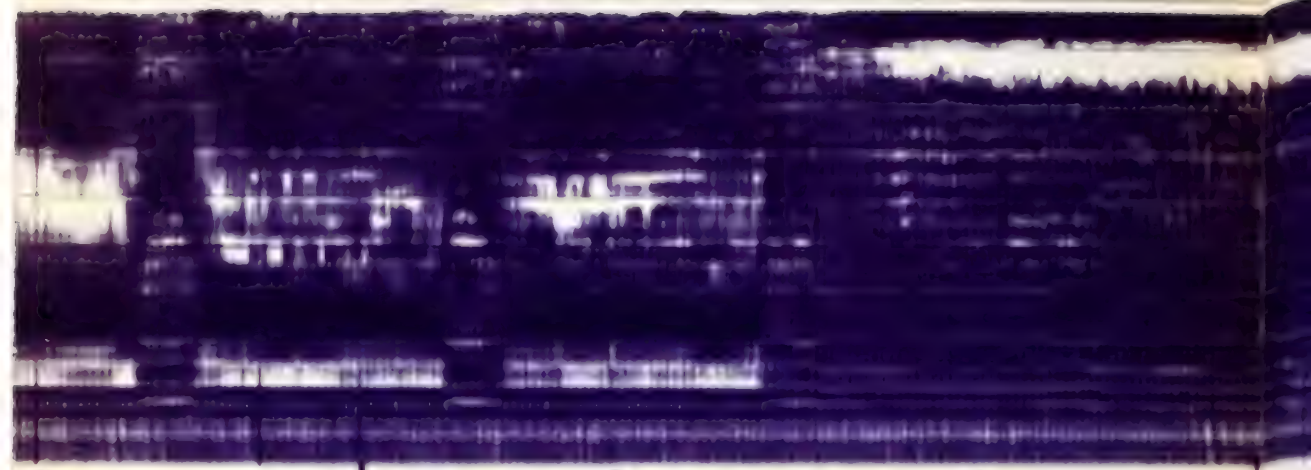




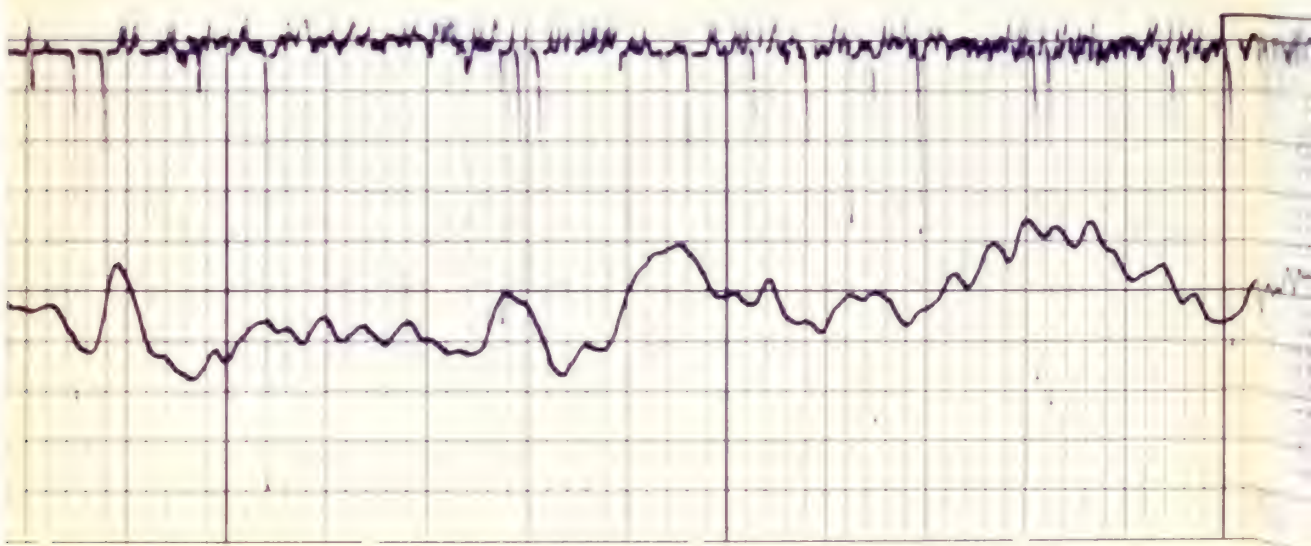


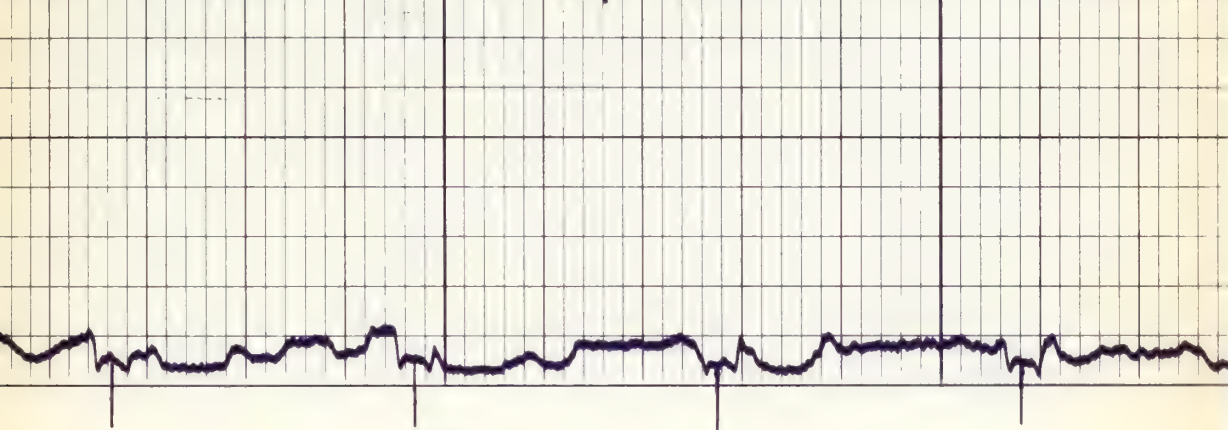
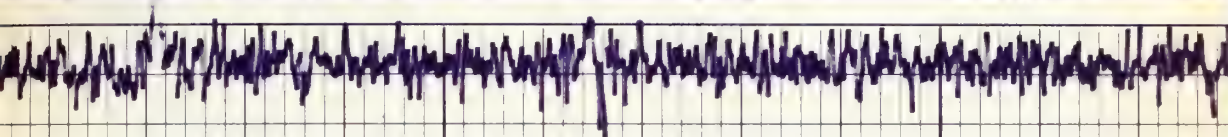
0900



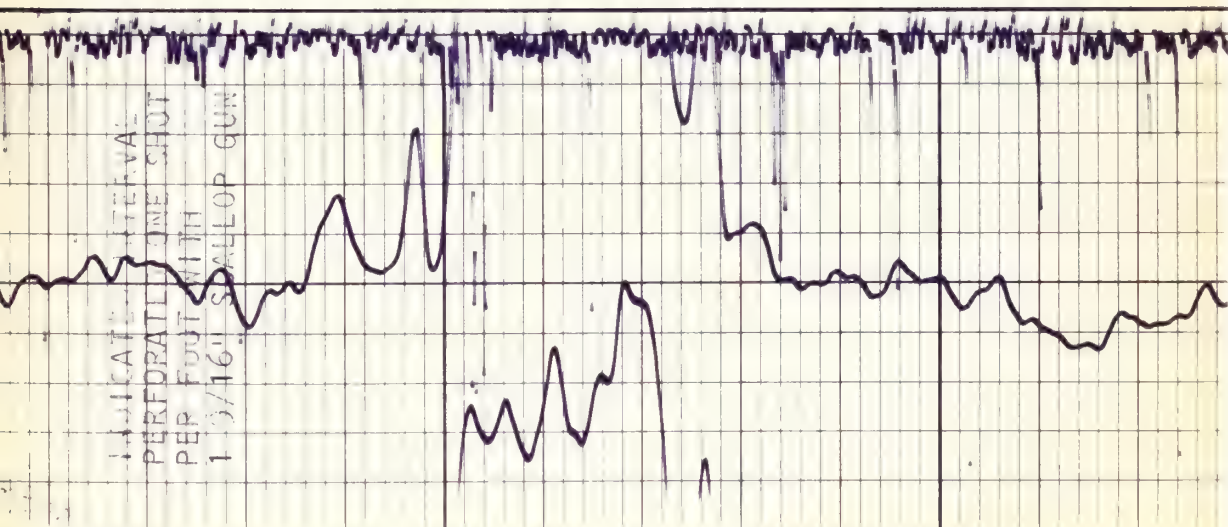


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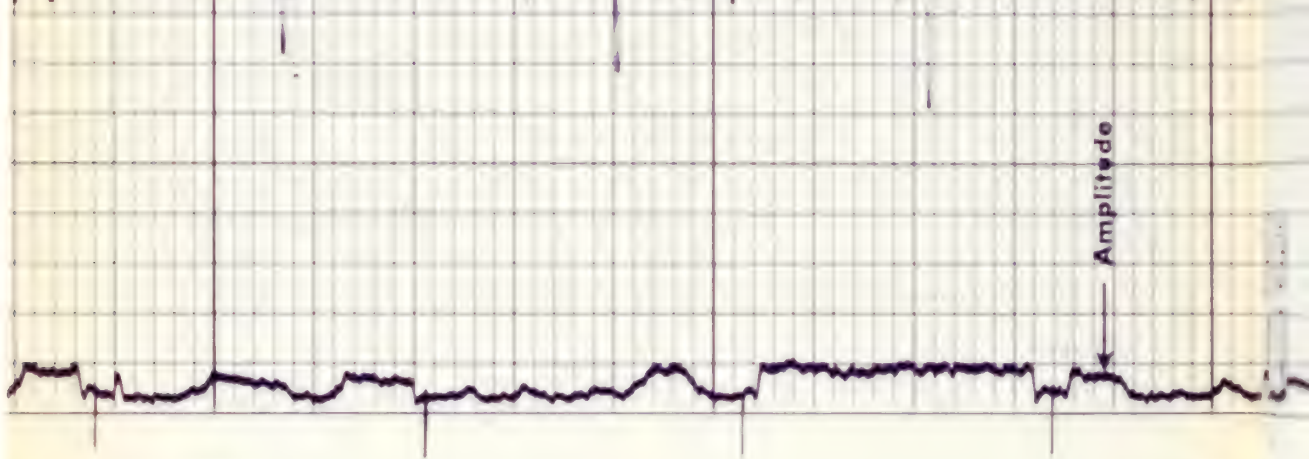
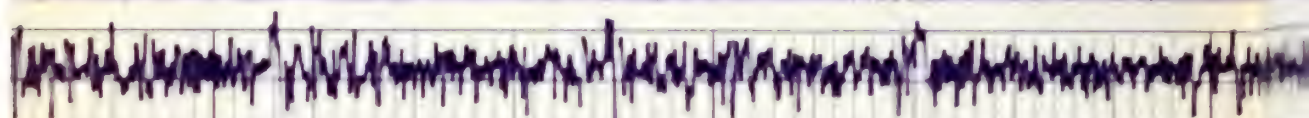
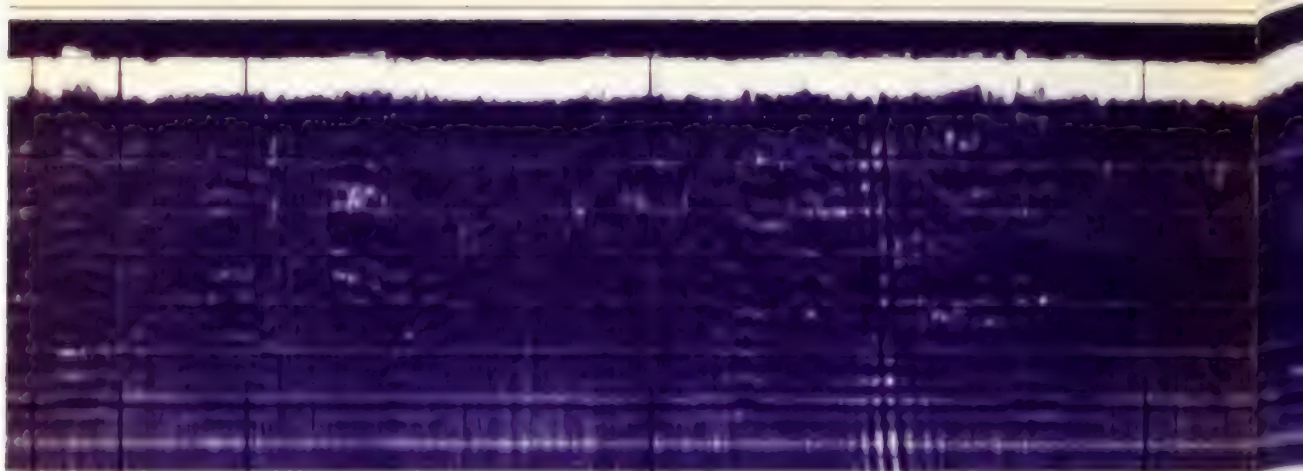




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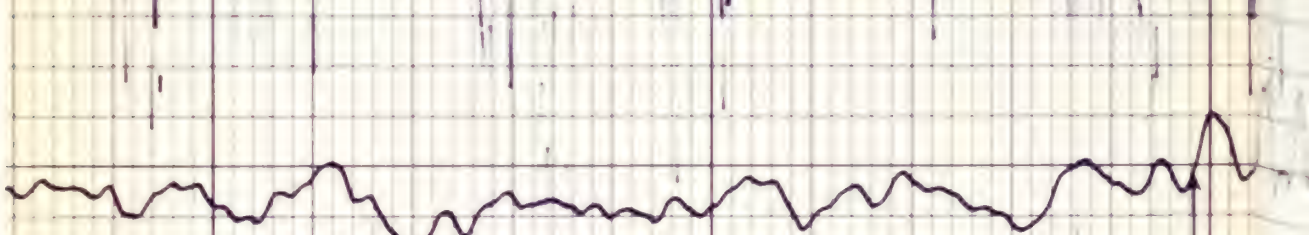
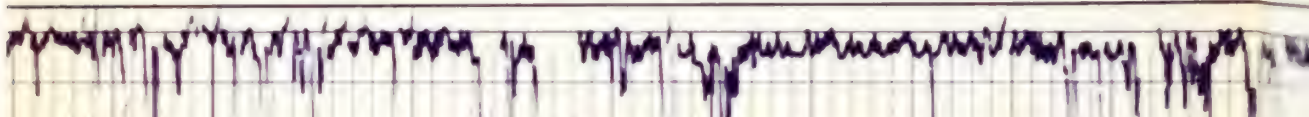
INDICATE INTERVAL
PERFORATION ONE SHOT
PER FOOT WITH
1 3/16" SALLUP GUN



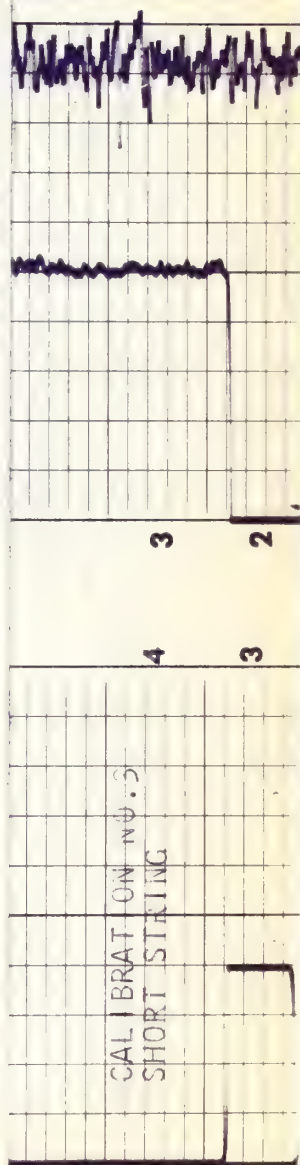
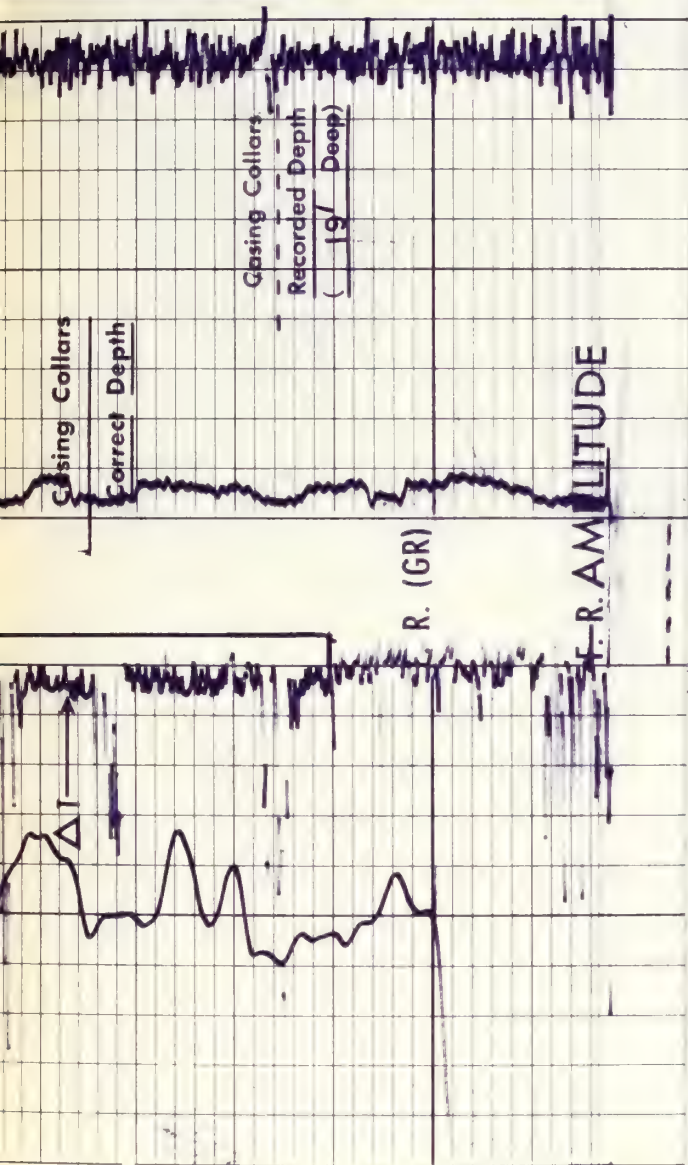
Amplitude

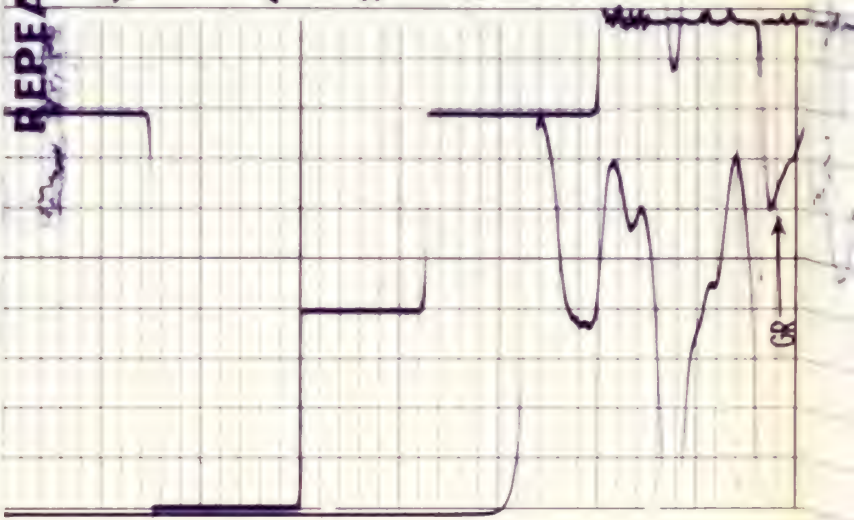
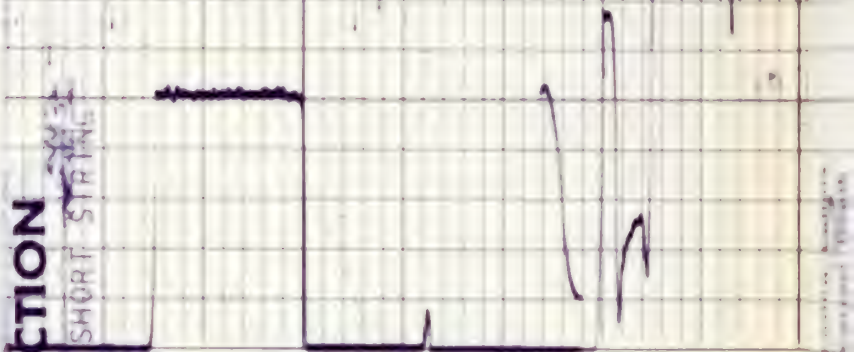
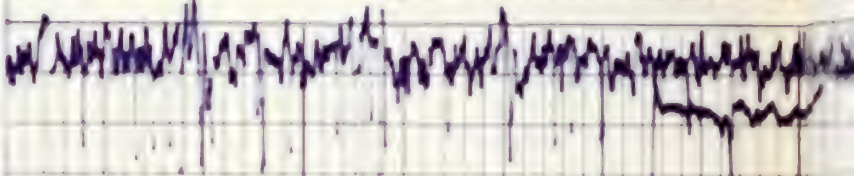
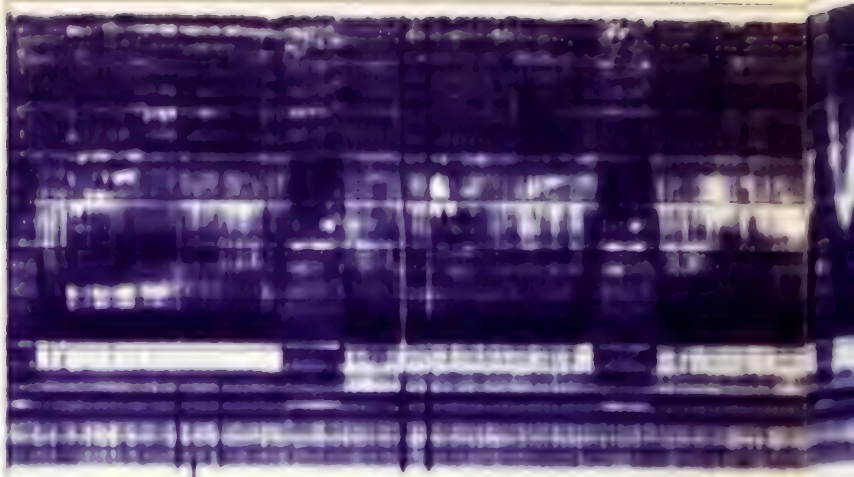
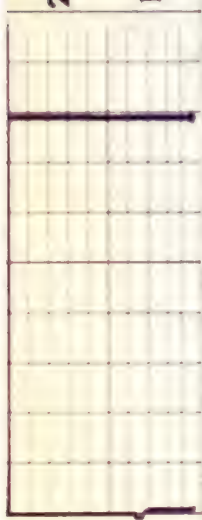
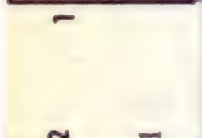
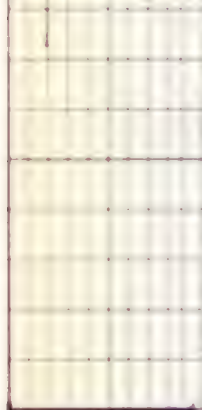
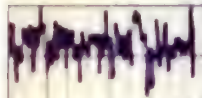
1200

1300



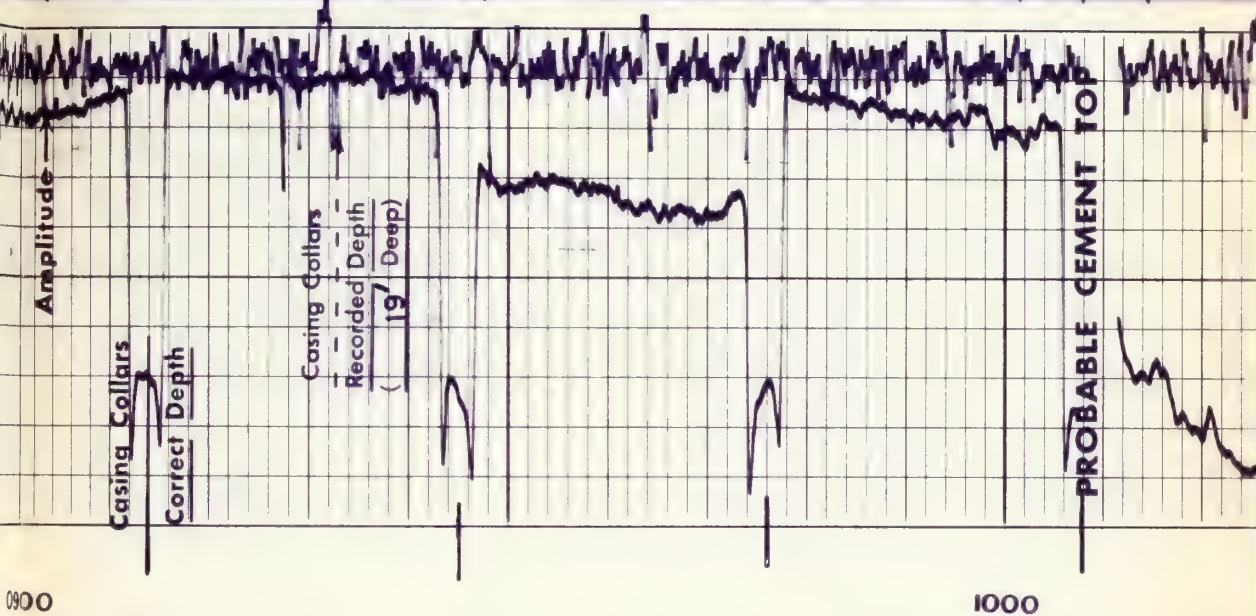
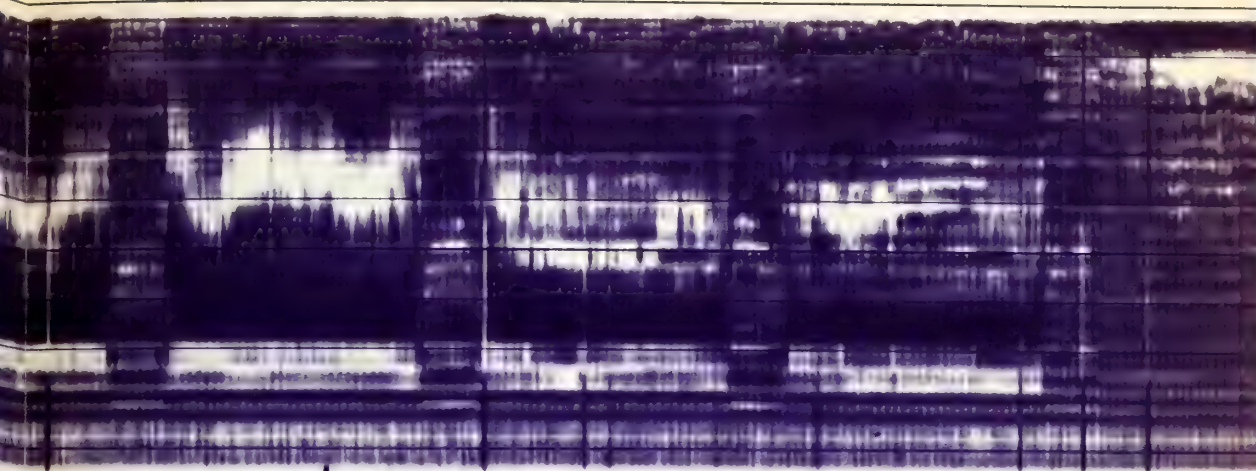
1300

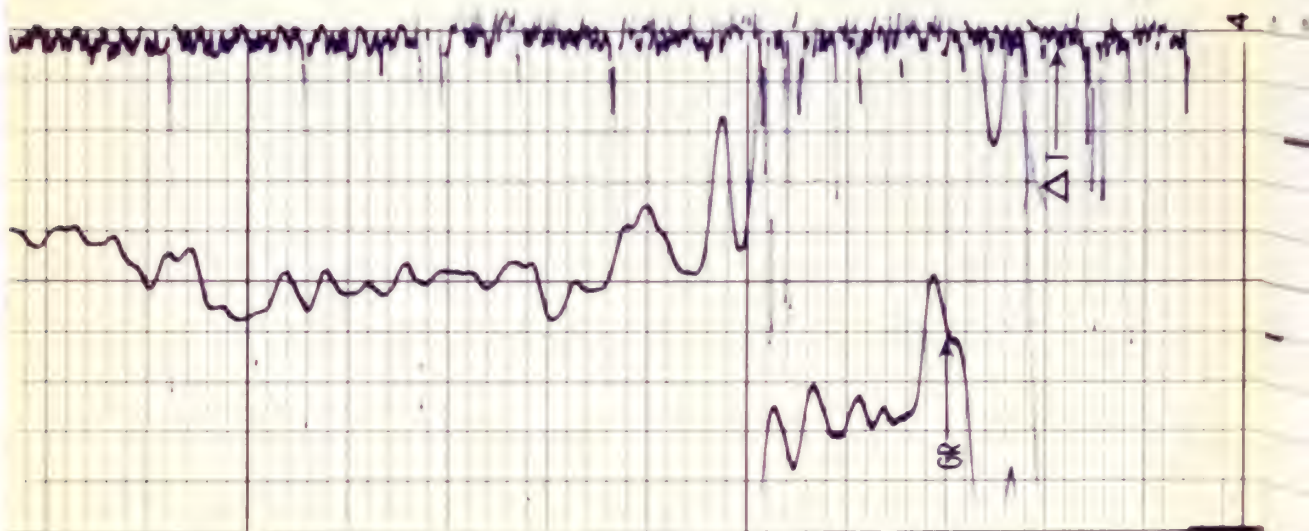
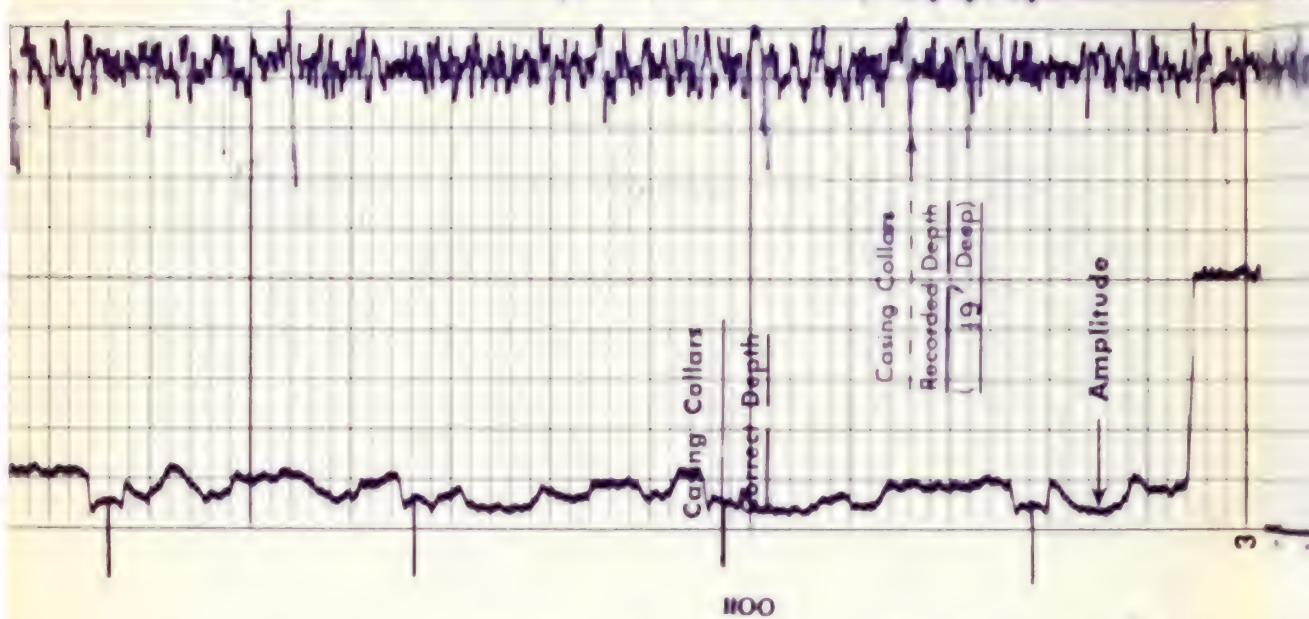
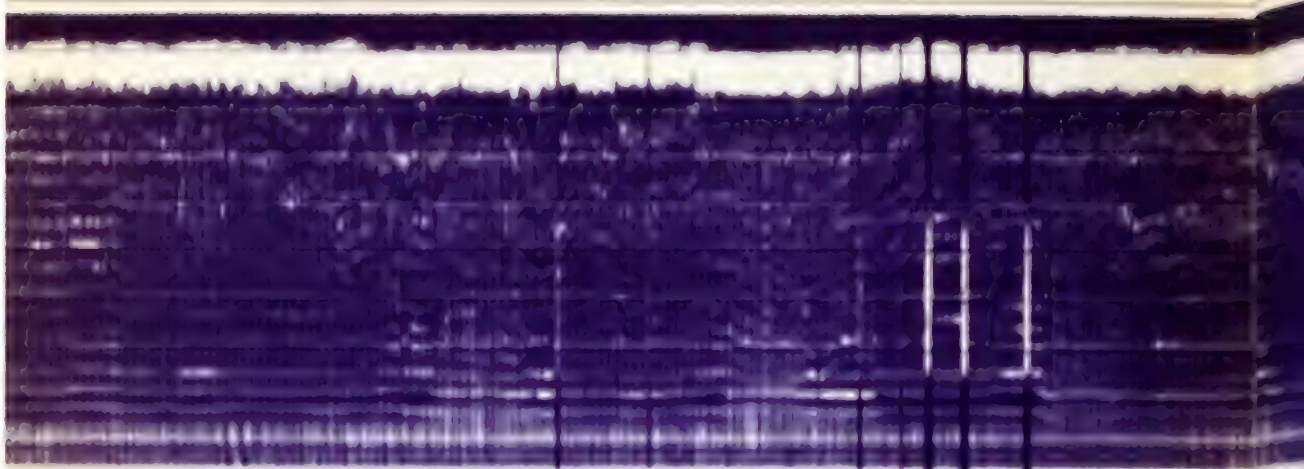


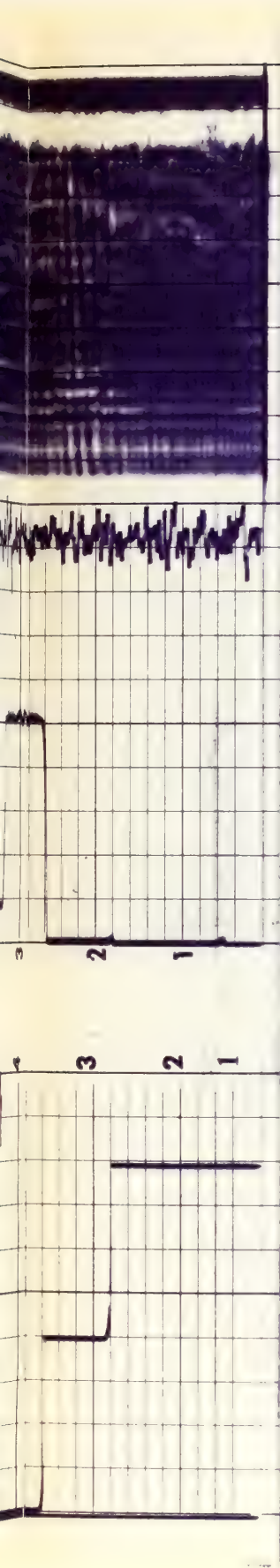


REPEAT SECTION

No. 3 SHORT STRAIN







| | | | |
|---|--|--|--|
| Casing Collars Corrected Depth | | VARIABLE DENSITY MICROSECONDS <u>5'</u> SPACING <u>200</u> <u>1200</u> | |
| Casing Collars Corrected Depth | | CASING BOND MILLIVOLTS <u>0</u> <u>1000</u> | |
| DEPTH | | | |
| TRANSIT TIME MICROSECONDS _____ SPACING <u>200</u> | | | |
| GAMMA RAY API UNITS | | | |
| COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | | ONE TWO THREE SCHL. FR <u>1628/1522/1367</u> | |
| WELL <u>AT-1C</u> | | SCHL. TD <u>1636/1530/1375</u> | |
| FIELD _____ | | DRLR TD <u>1638/1528/1373</u> | |
| COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> | | Elev: KB <u>----</u> DF <u>----</u> GL <u>6909</u> | |

CEMENT BOND CALIBRATION CODING

- | | Δt | AMPLITUDE |
|--------------------|------------|-----------------|
| 1. MECHANICAL ZERO | | MECHANICAL ZERO |
| 2. 240 μ sec | | ELECTRICAL ZERO |
| 3. 320 μ sec | | CALIBRATE |

4

St...

Schlumberger**ORIENTED PERFORATING RECORD
AND CASING COLLAR LOG**

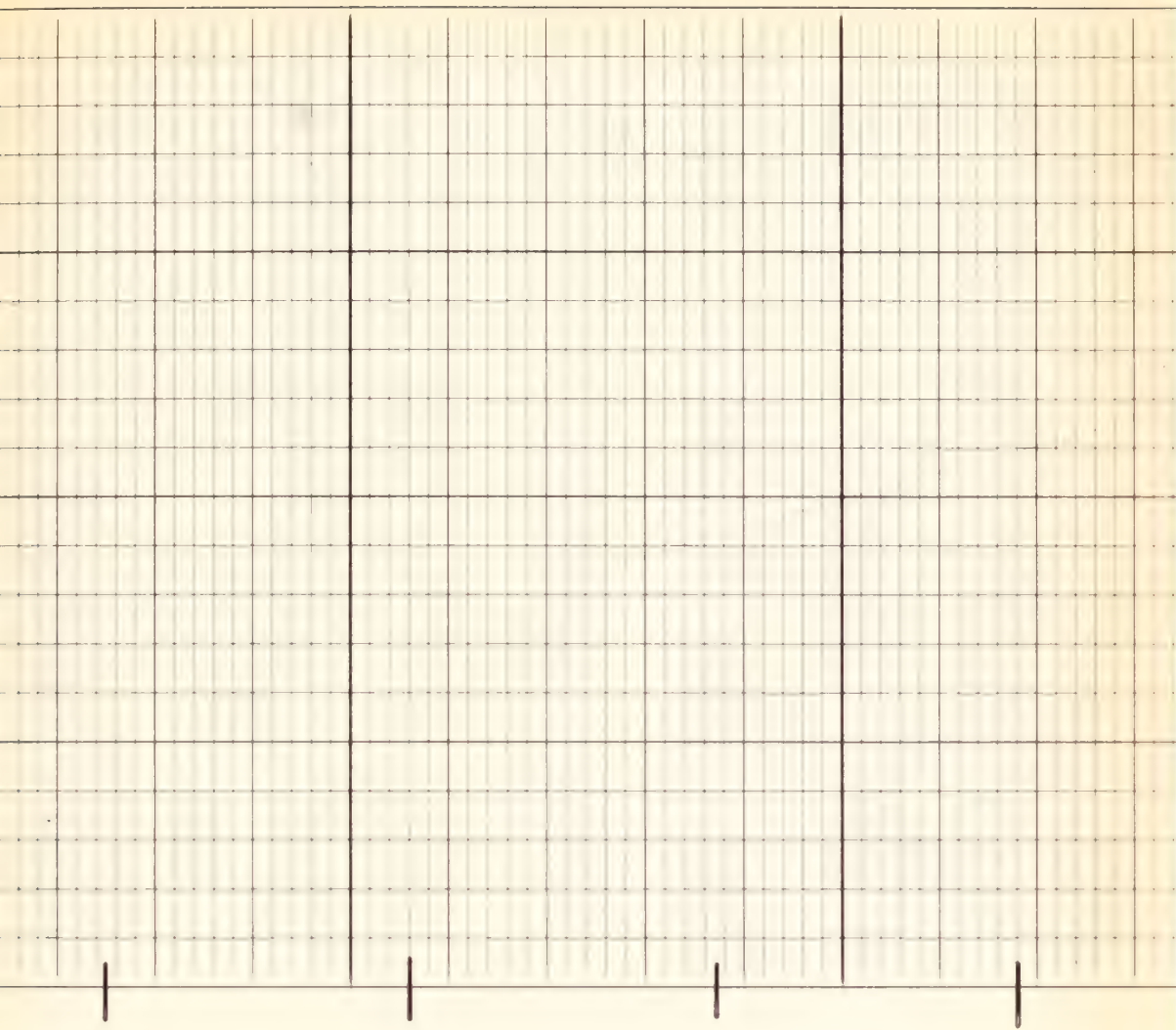
| | | |
|---|--|--|
| COUNTY <u>RIO BLANCO</u> FIELD or LOCATION <u>SORGHUM GULCH</u> WELL <u>AT-1C</u> COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | |
| | WELL <u>AT-1C</u> | |
| | FIELD <u>SORGHUM GULCH</u> | |
| | COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> | |
| | Location: _____ | |
| Other Services: CBL-GR- VDL-CCL | | |
| Sec. <u>7</u> Twp. <u>3S</u> Rge. <u>96W</u> | | |

| | |
|--|-------------------------|
| Permanent Datum: <u>GROUND LEVEL</u> ; Elev.: <u>6909</u> | Elev.: K.B. <u>----</u> |
| Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum | D.F. <u>----</u> |
| Drilling Measured From <u>GL</u> | G.L. <u>6909</u> |

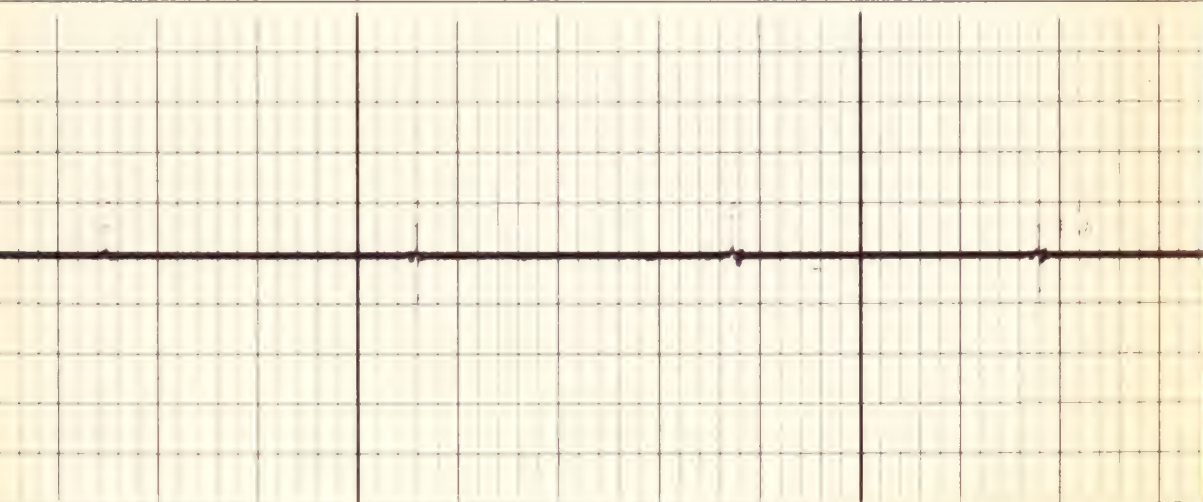
| | |
|------------------------|--------------------------|
| Date | <u>9/19/74</u> |
| Run No. | <u>ONE</u> |
| Pipe String No. | <u>1-2-3</u> |
| Pipe String Ident. | <u>LONG-MIDDLE-SHORT</u> |
| Type Orienting | <u>POWERED</u> |
| Type fluid in hole | <u>WATER</u> |
| Salinity, PPM Cl. | <u>----</u> |
| Density | <u>----</u> |
| Level | <u>FULL</u> |
| Max rec. temp., deg F. | <u>----</u> |
| Operating rig time | |
| Recorded by | <u>ST. AUBYN</u> |
| Witnessed by | <u>MR. ROSS-</u> |
| | <u>MR. ELLARD</u> |

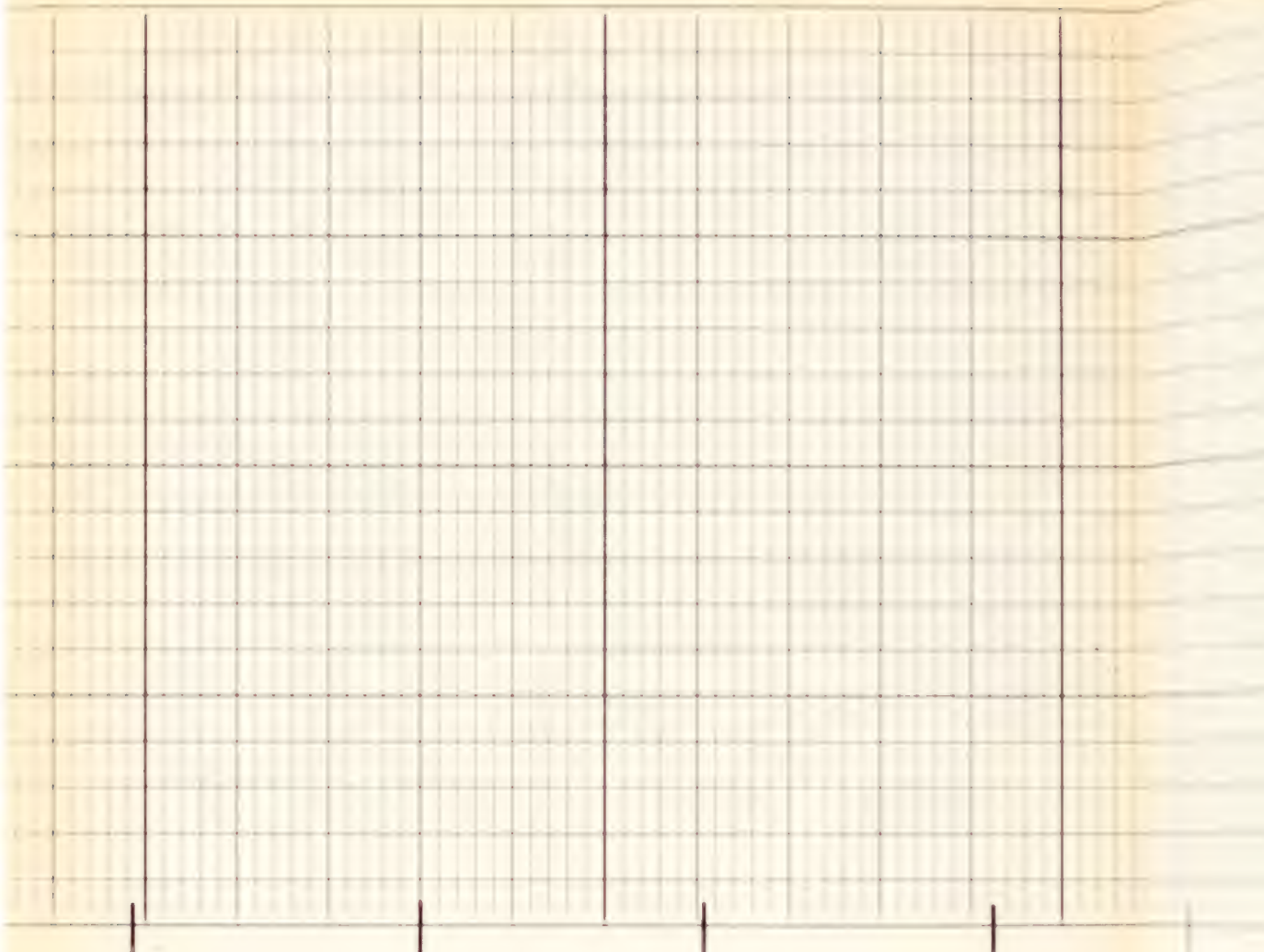
| BORE-HOLE RECORD | | | CEMENTING RECORD | | | |
|------------------|------|----|------------------|------|------|----|
| Bit | From | To | Type | Wgt. | From | To |
| | | | Primary | | | |
| | | | Squeeze | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Casing Collar Log Before Perforation | | Depths | |
|--|--|--------|--|
| NO. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 | | 0900 | |

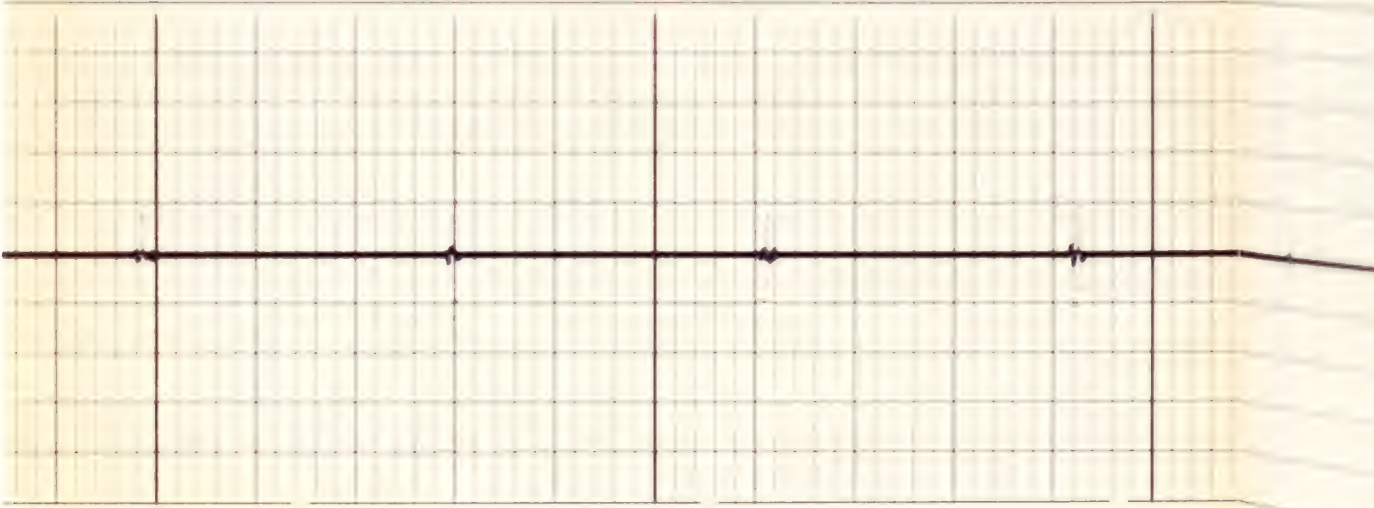


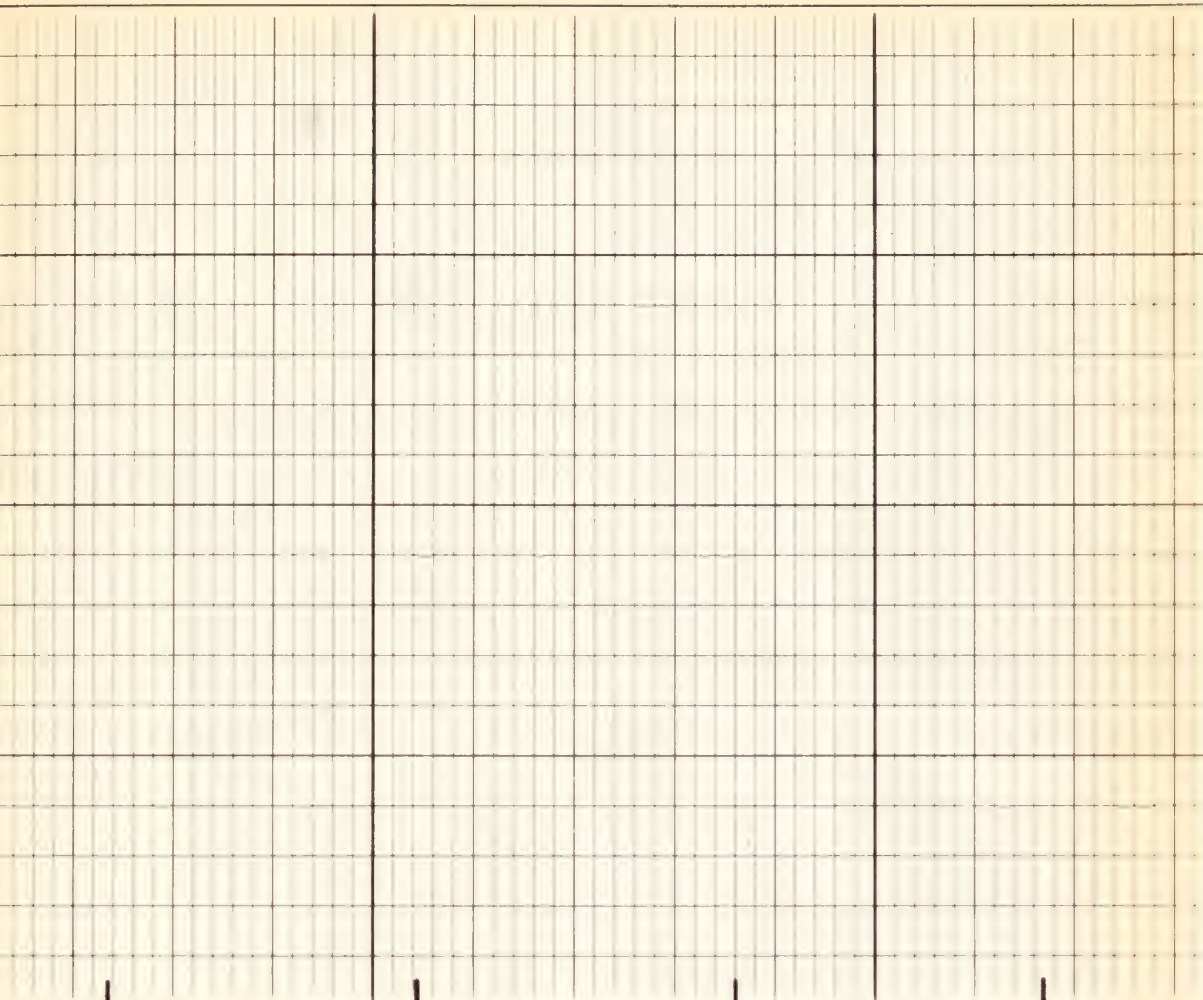
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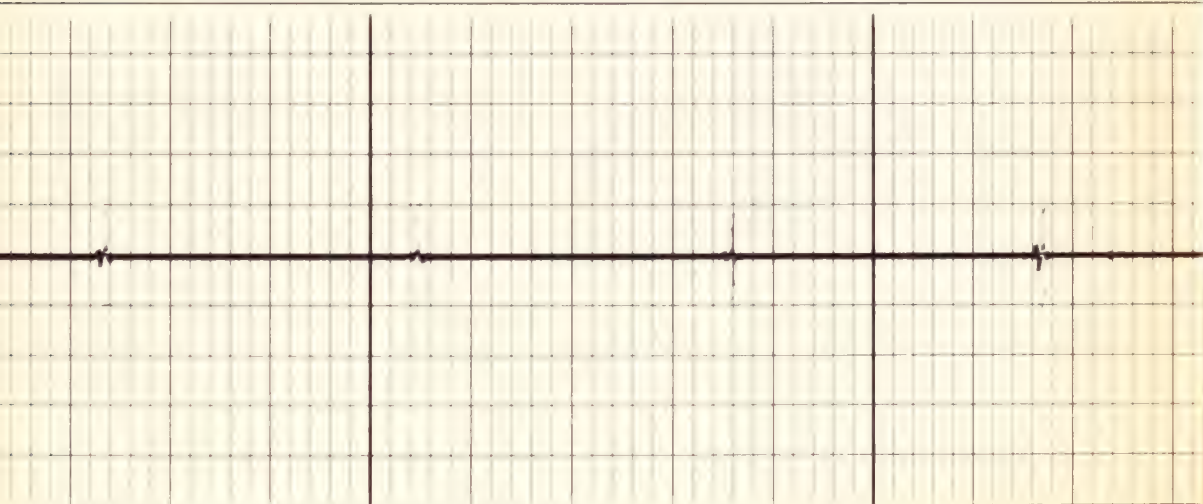


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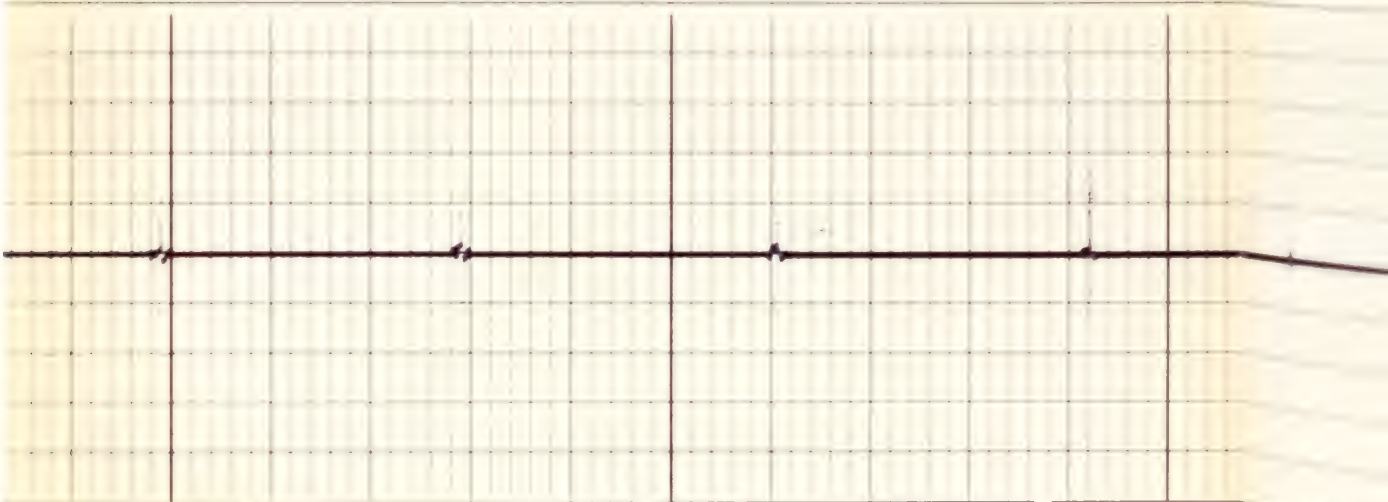


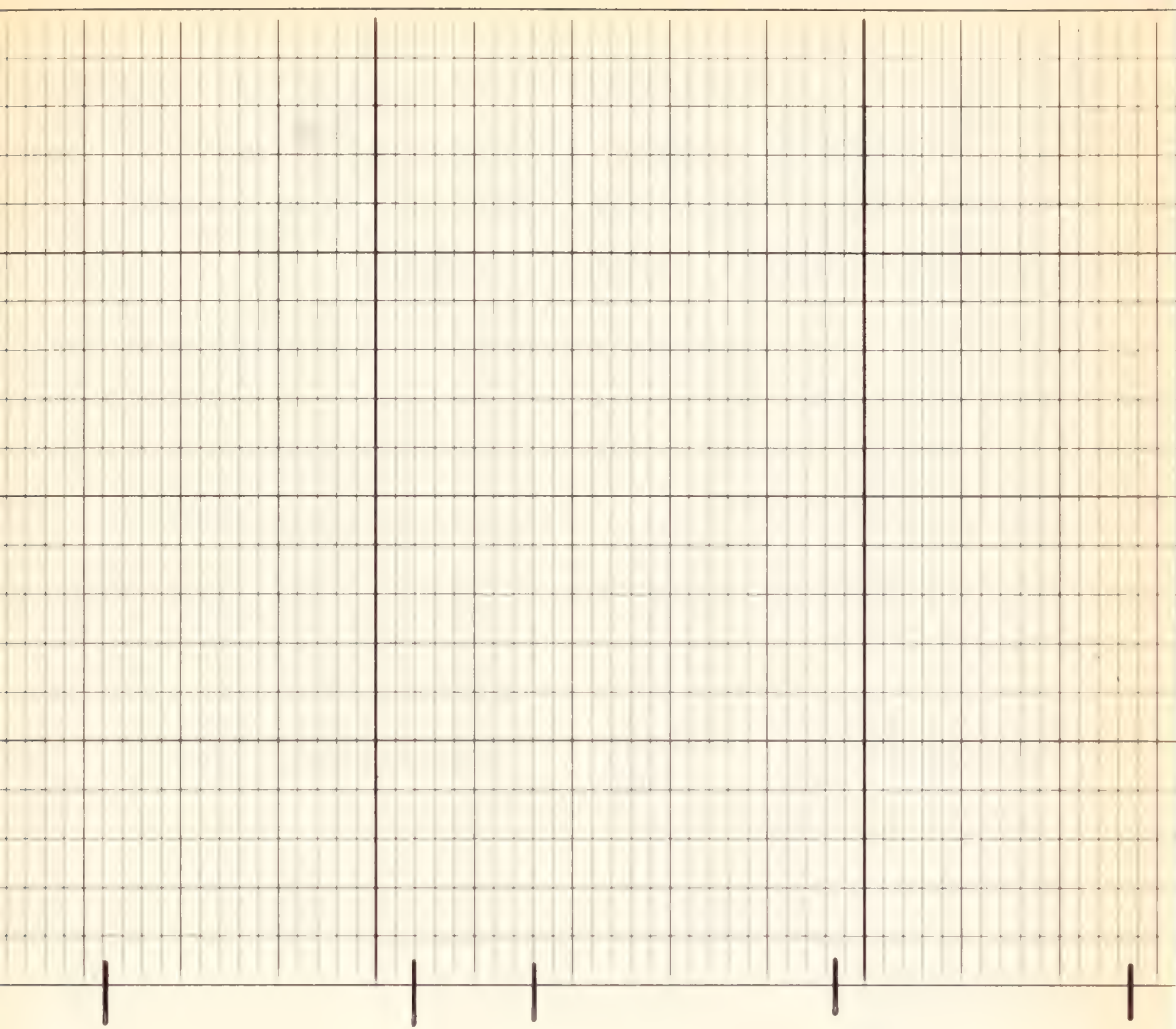
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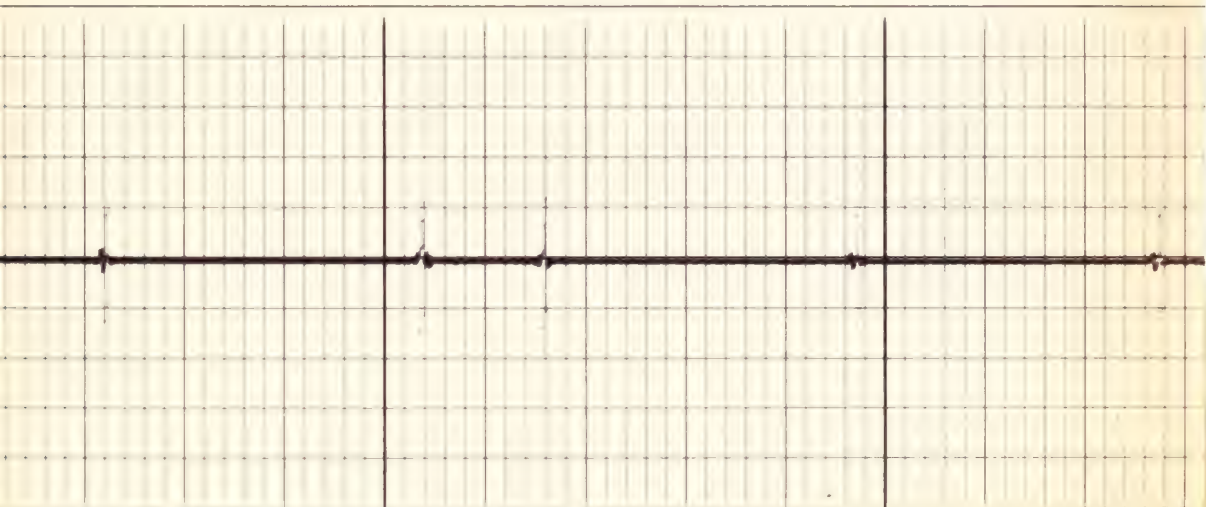
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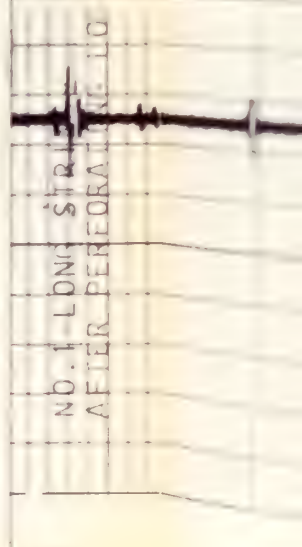
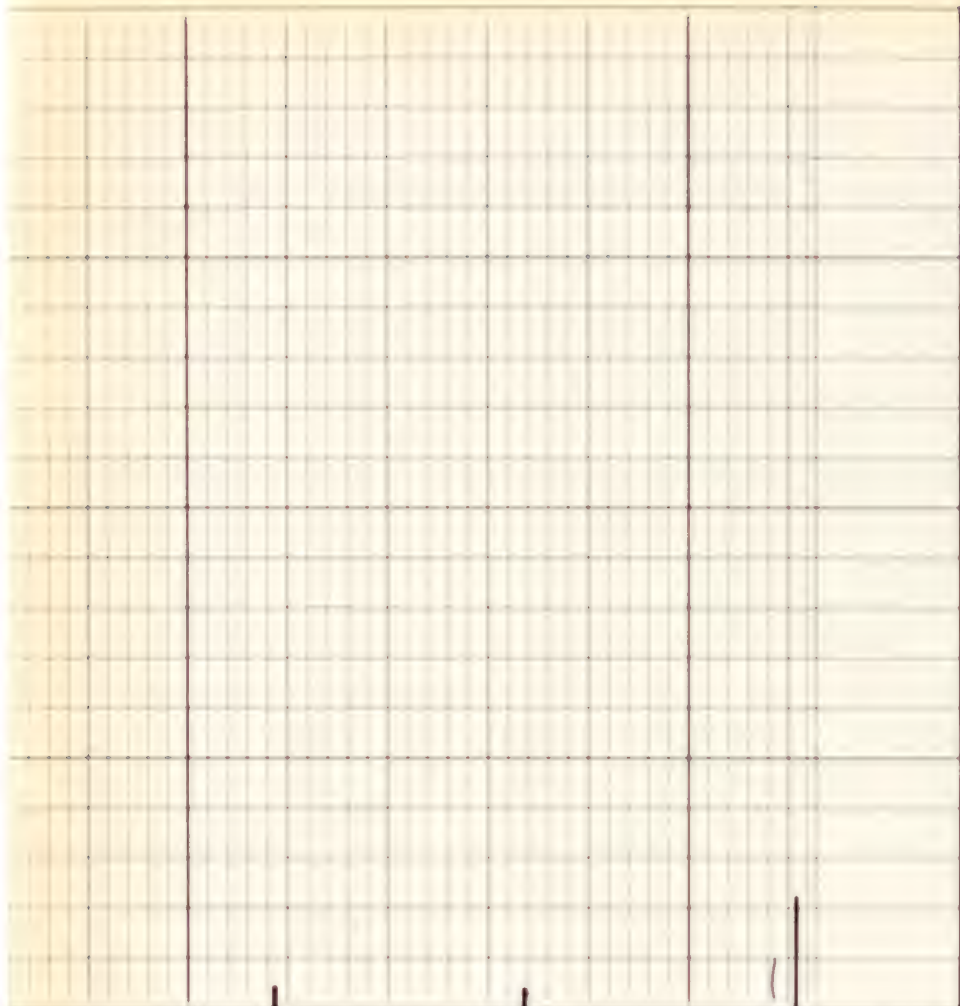
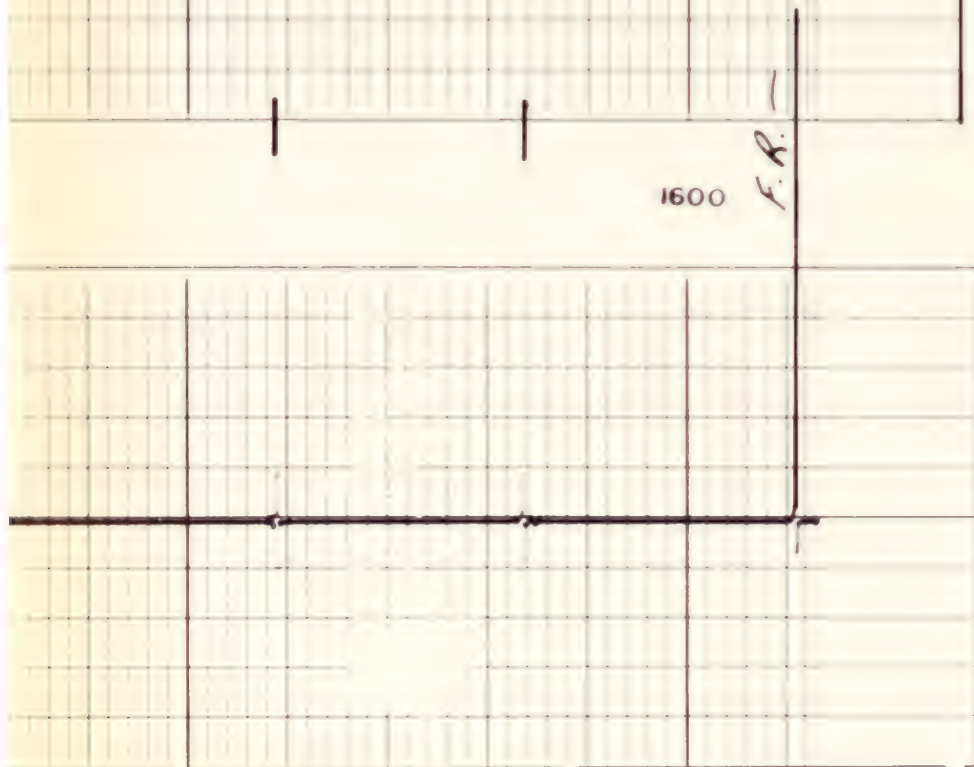
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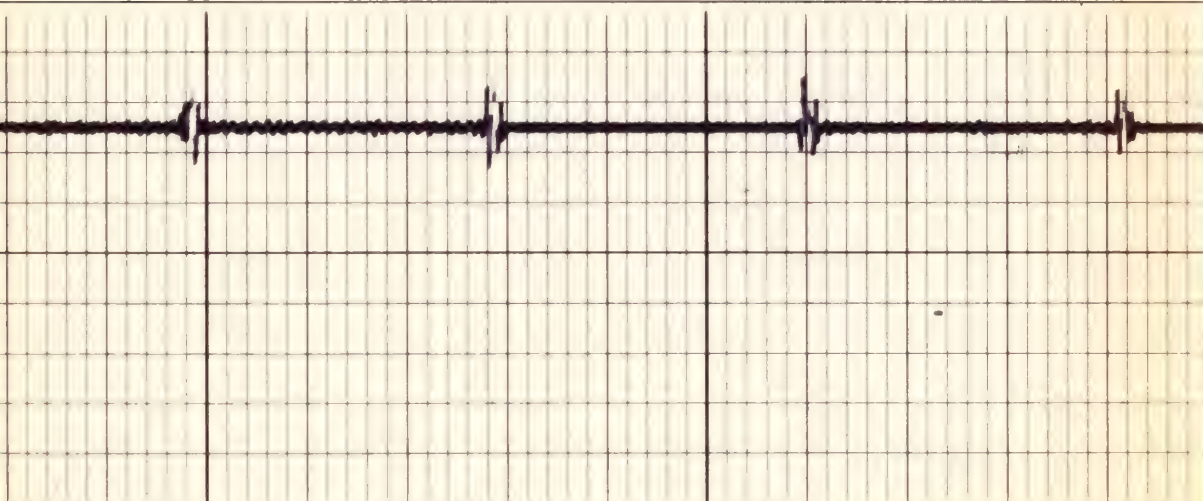
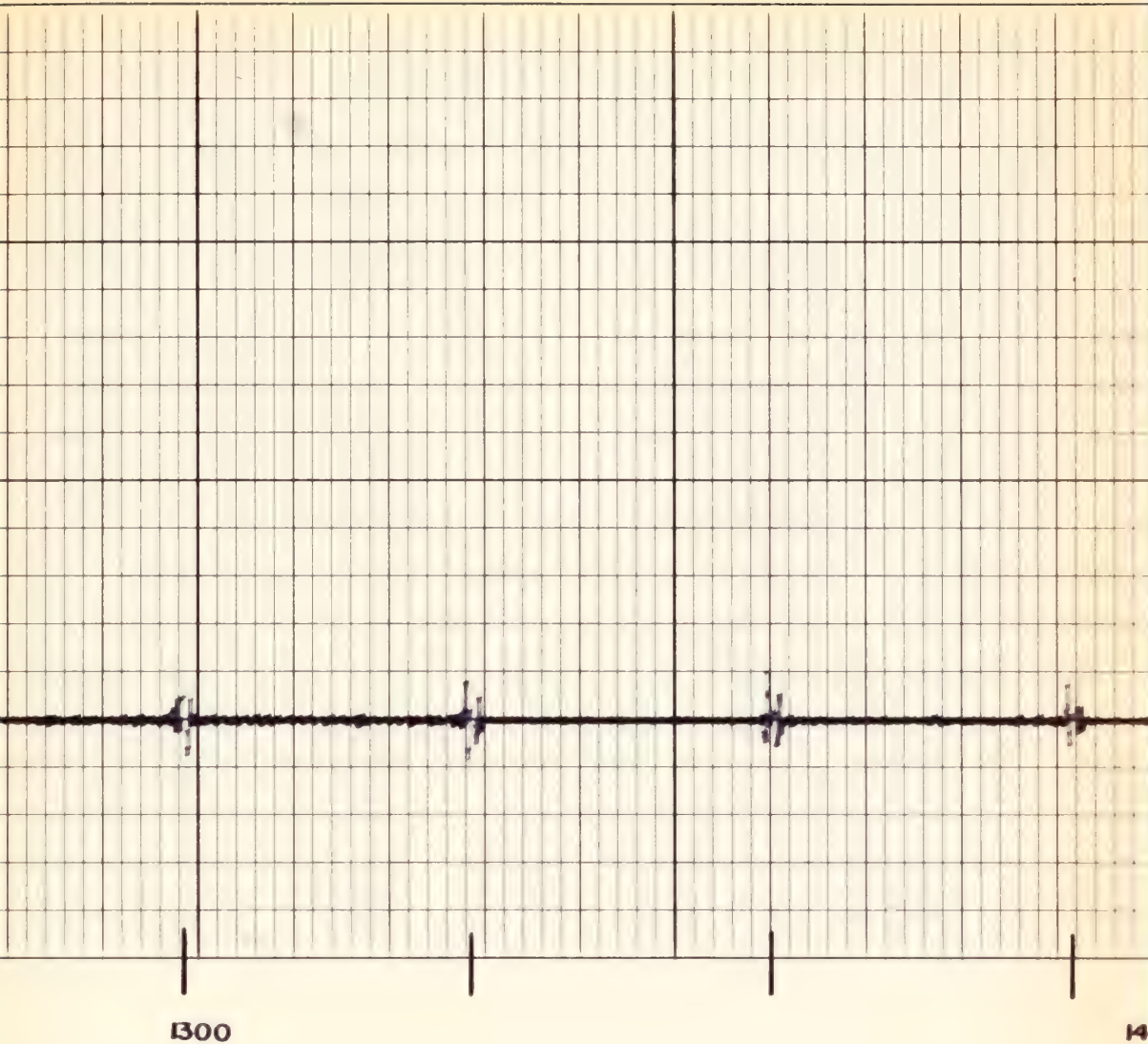


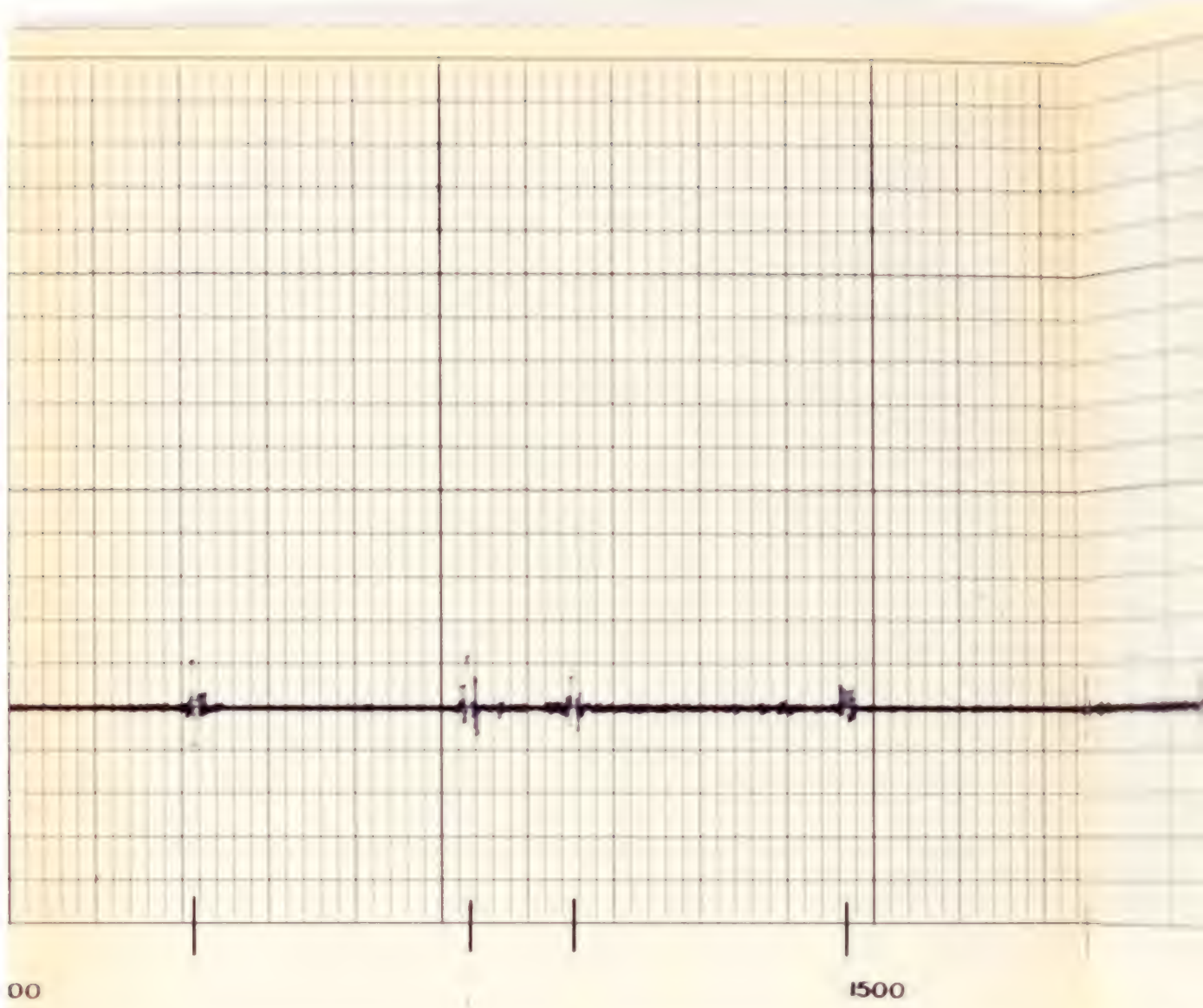


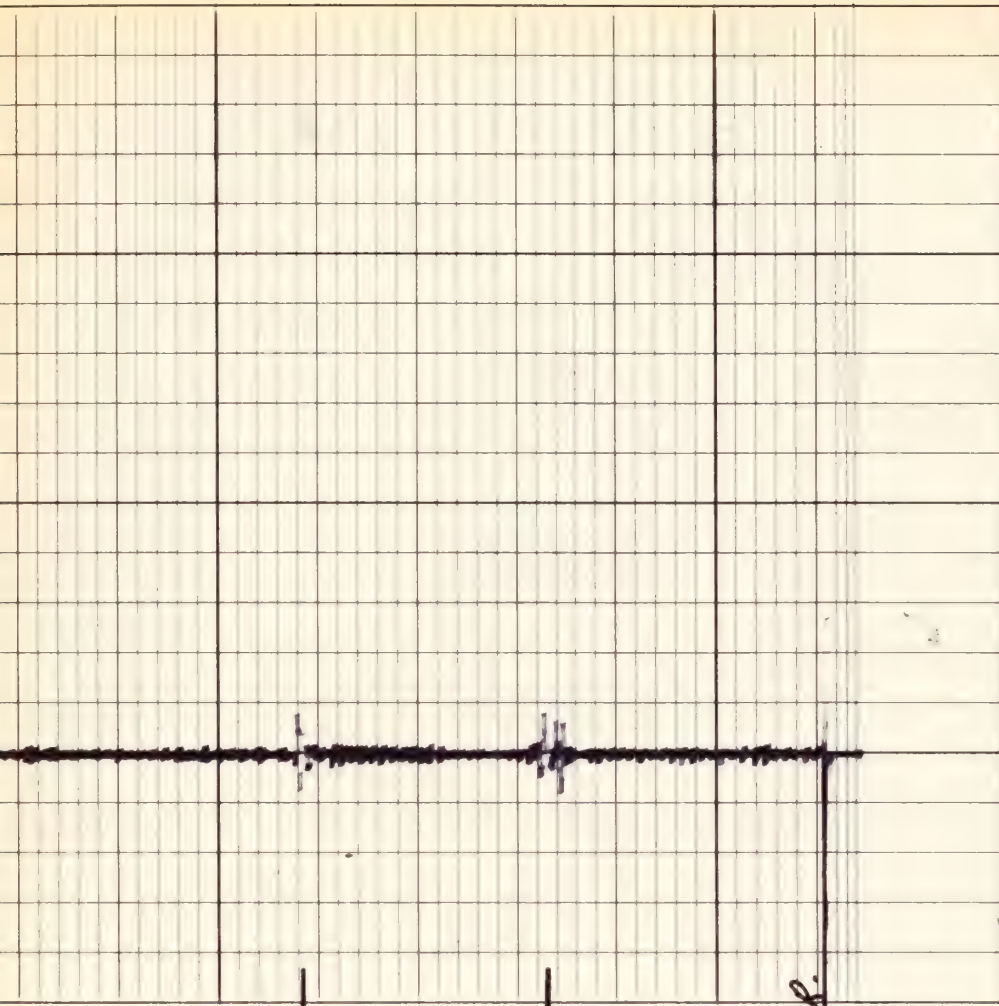
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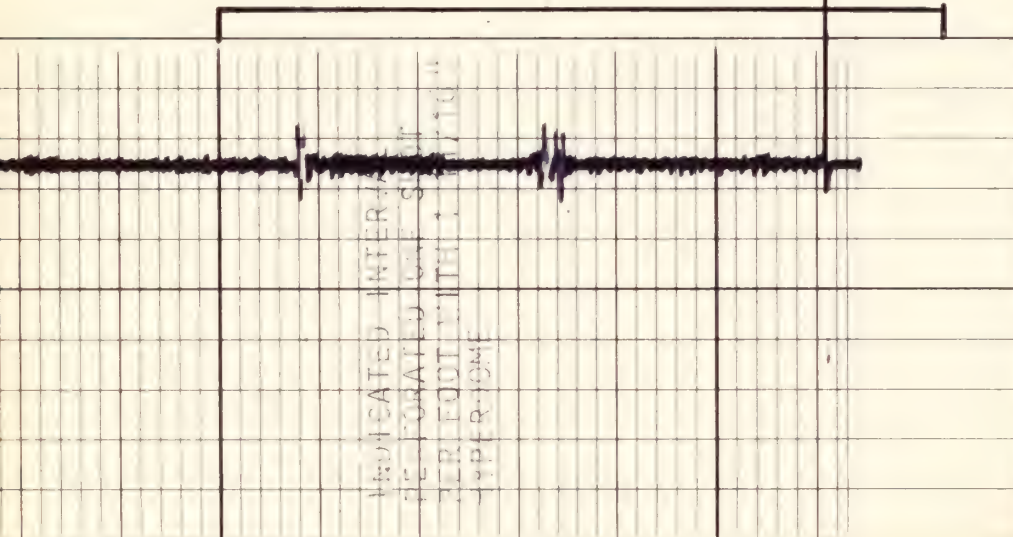




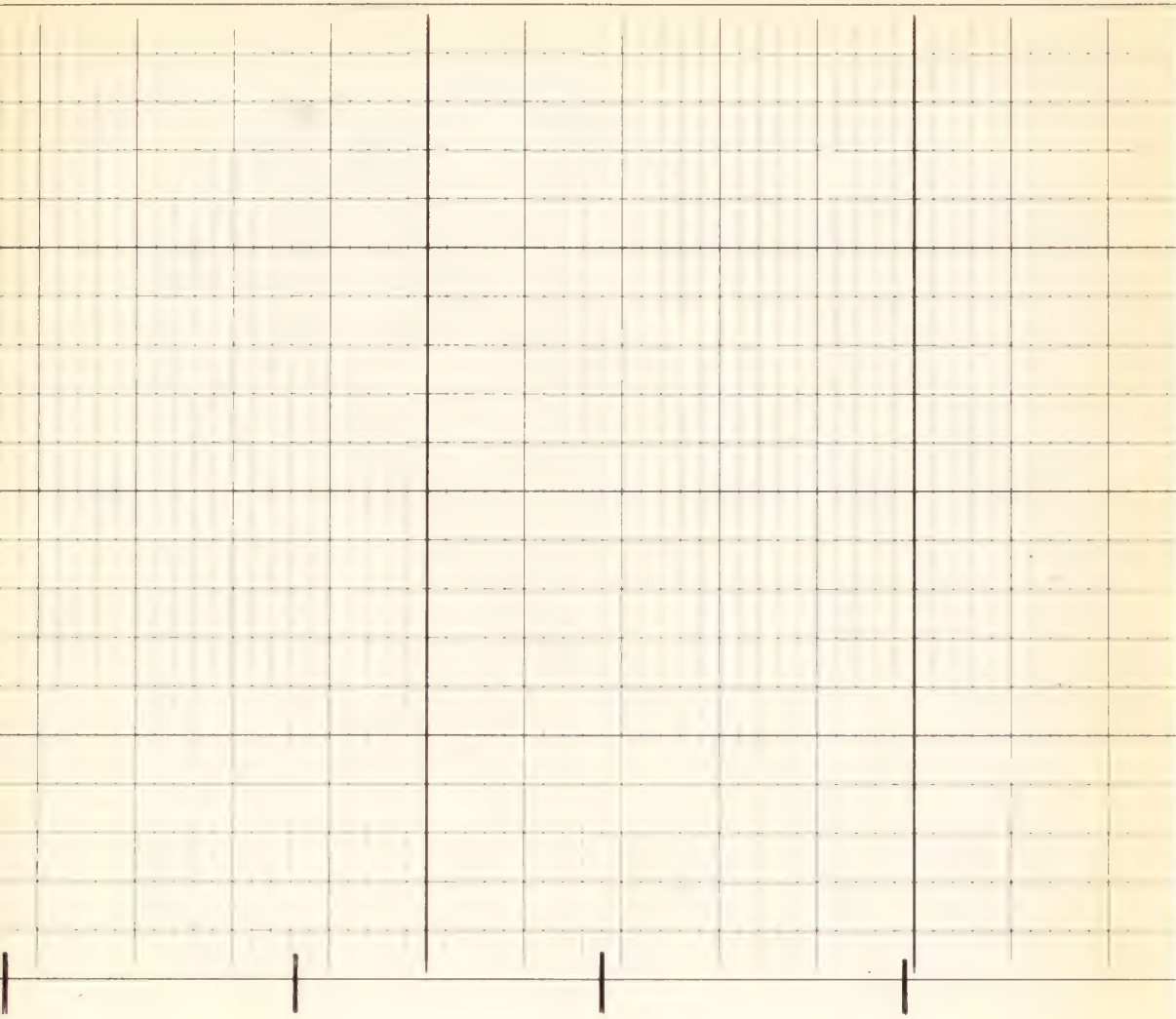


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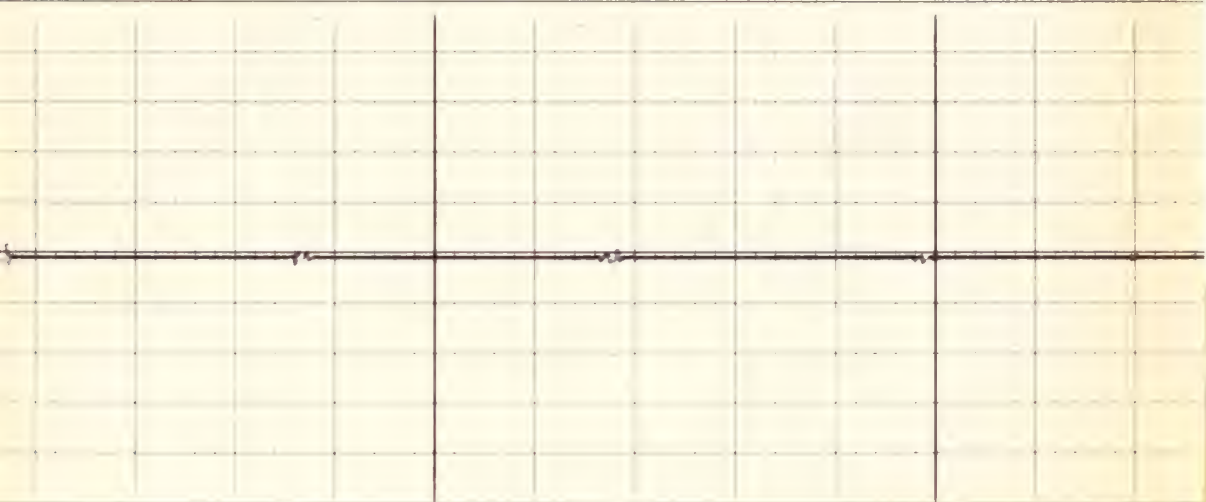
F.R.

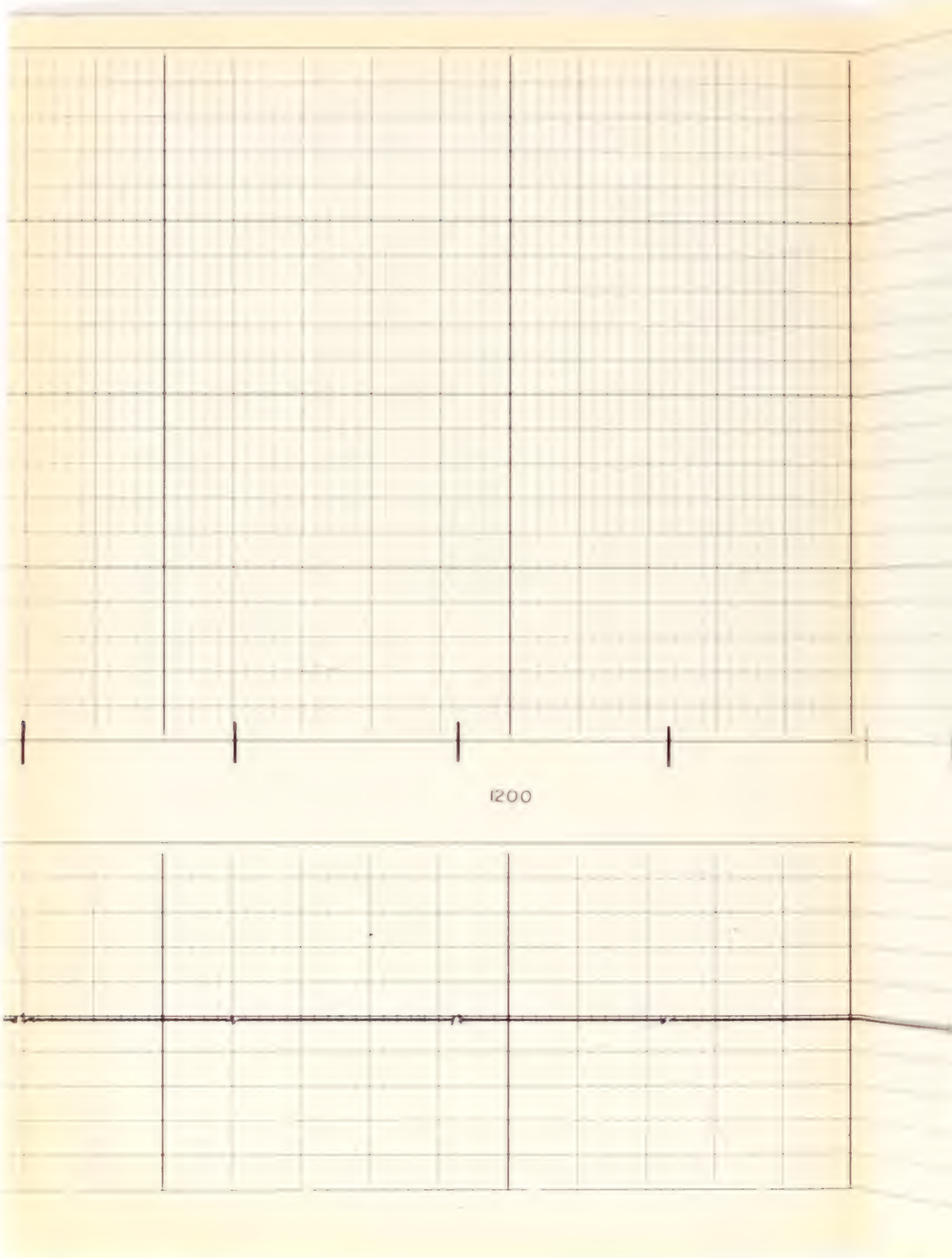


INDICATED INTER-VENT
PERFORATED ONE S

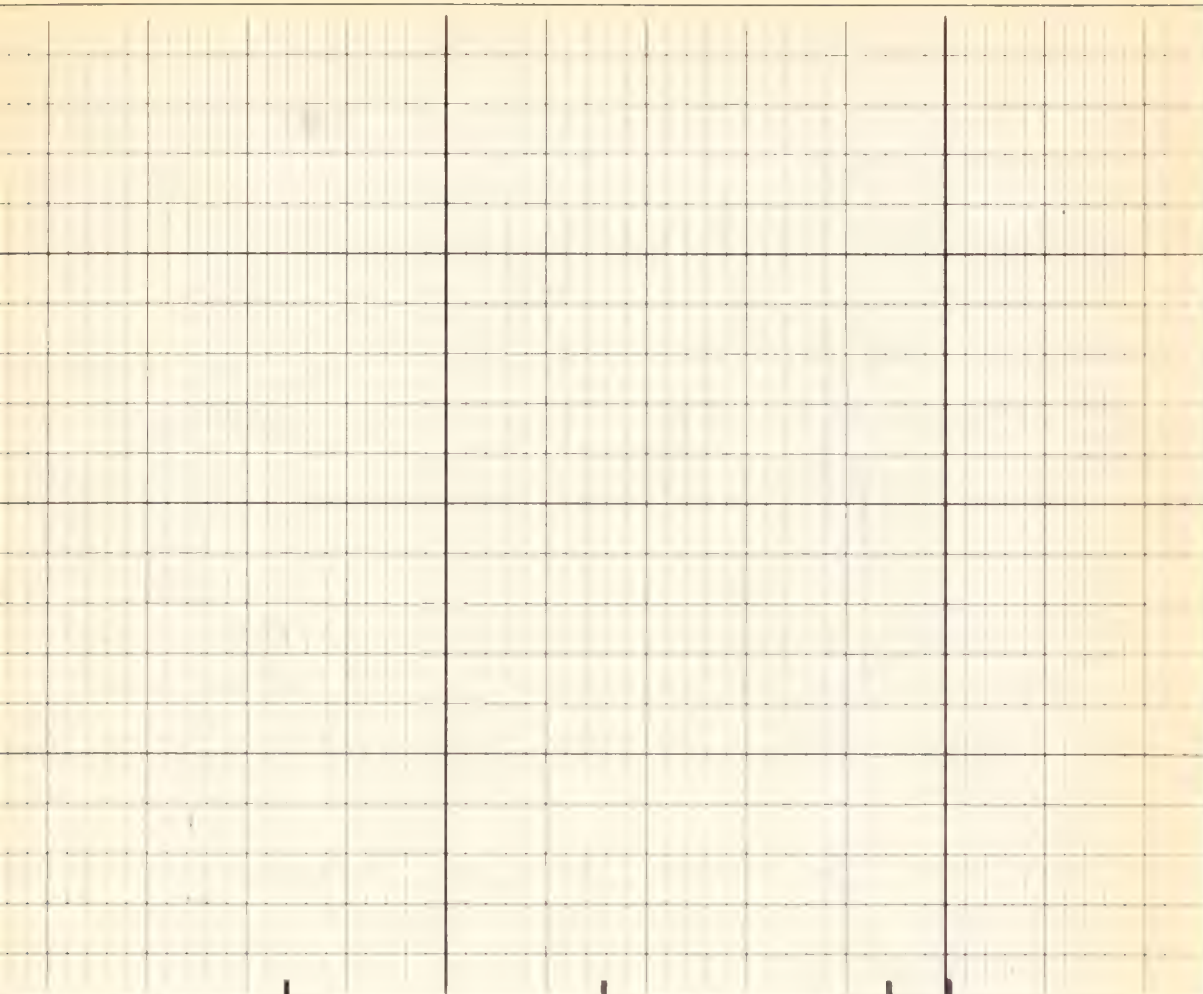


1100

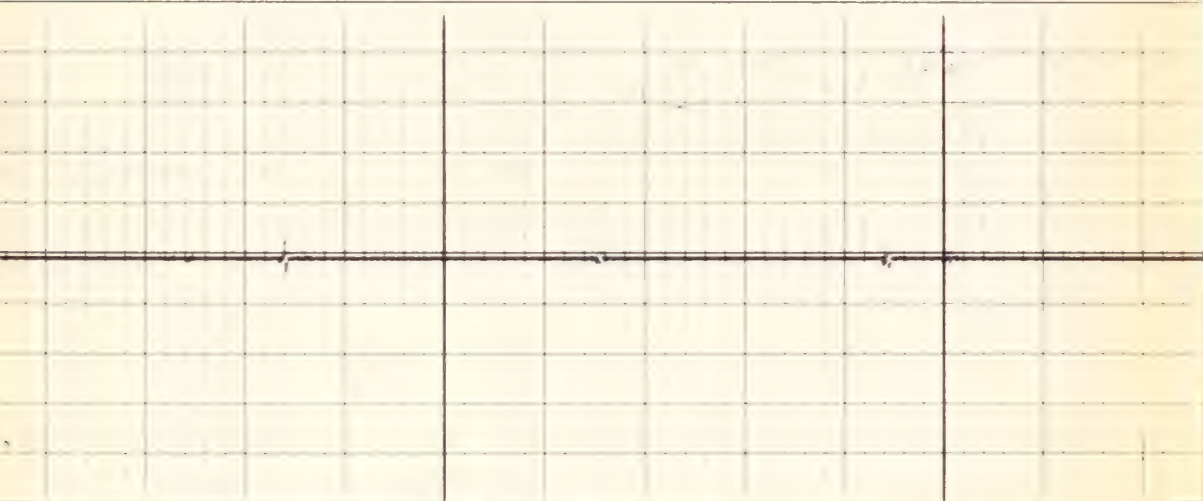


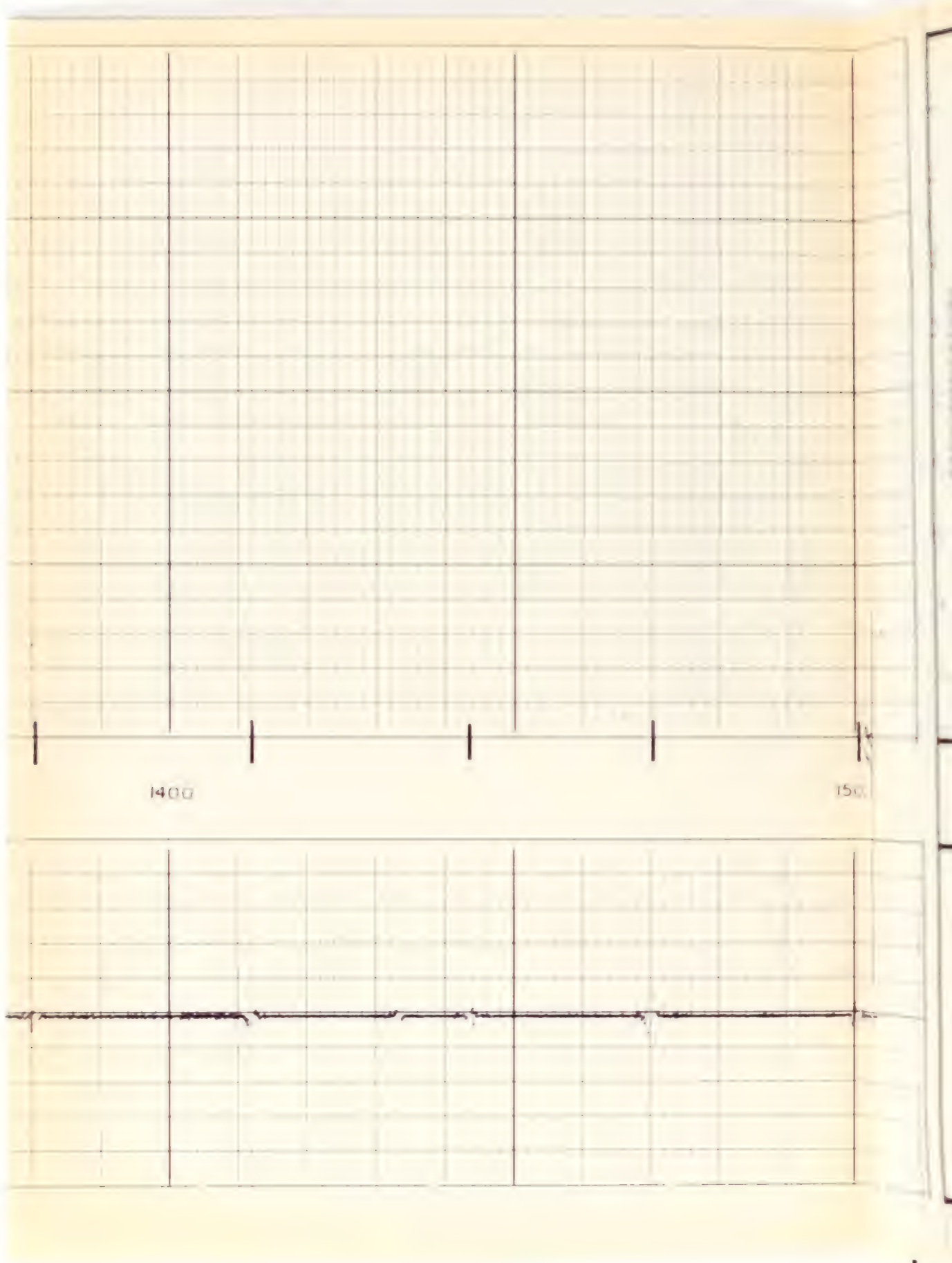


1200



1300





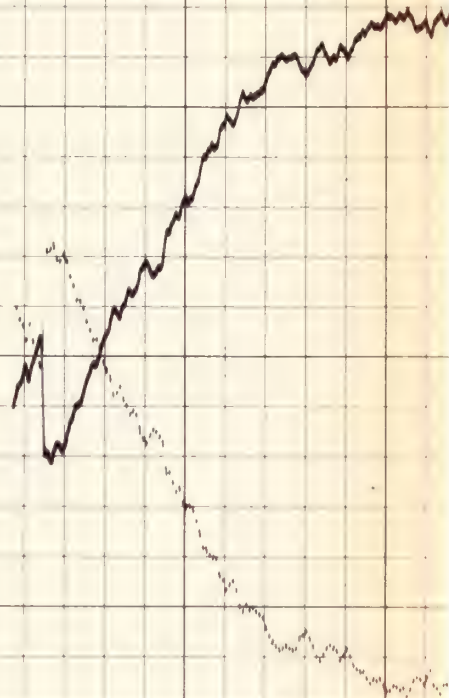
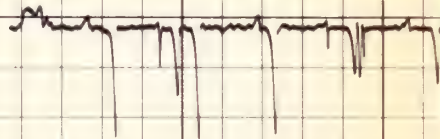
INDEXING RECORD

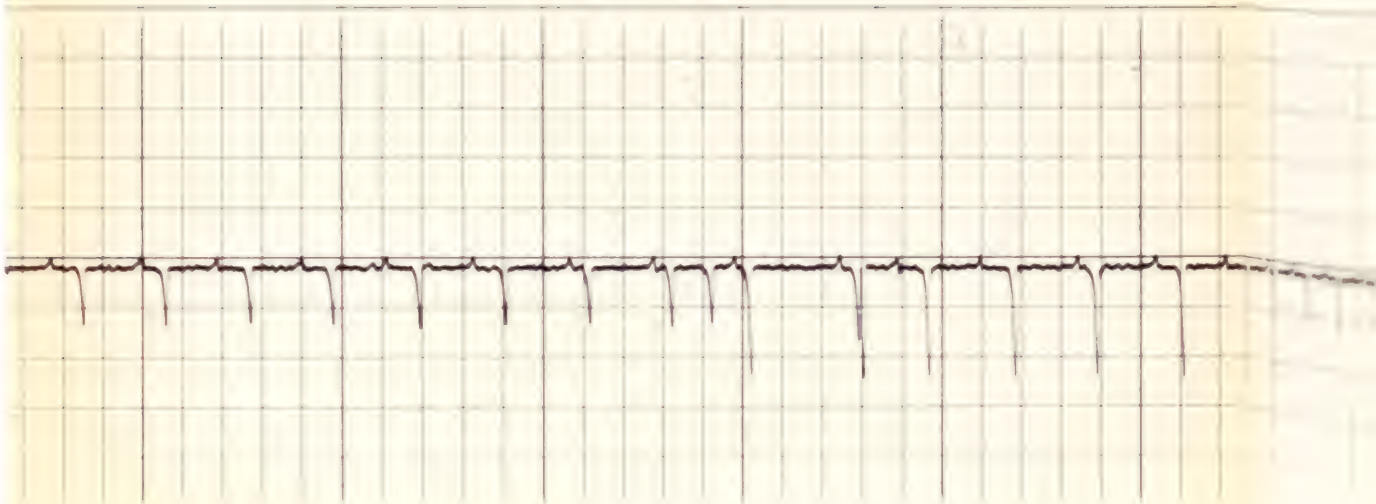
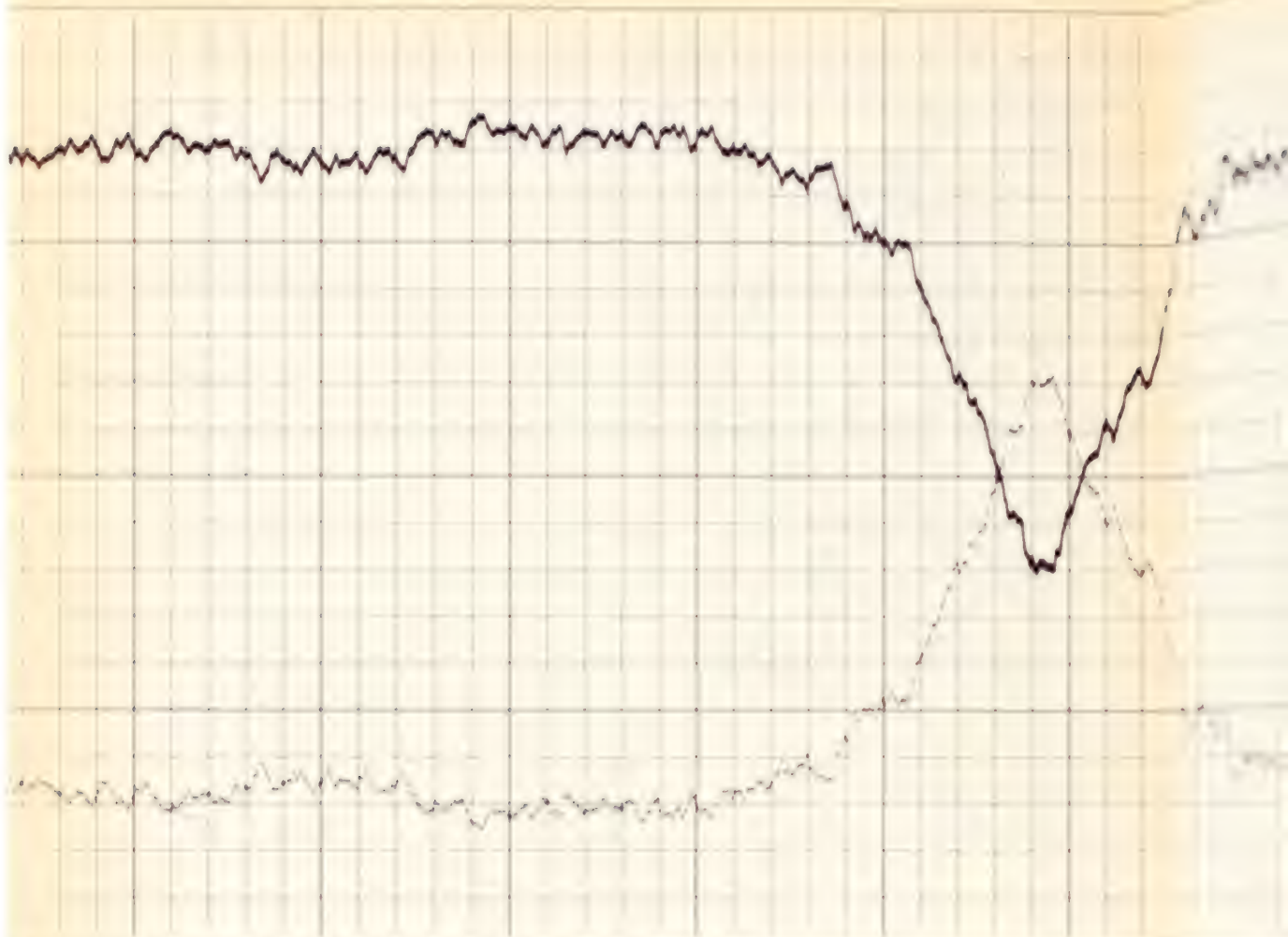
RADIORIENTATION RECORD

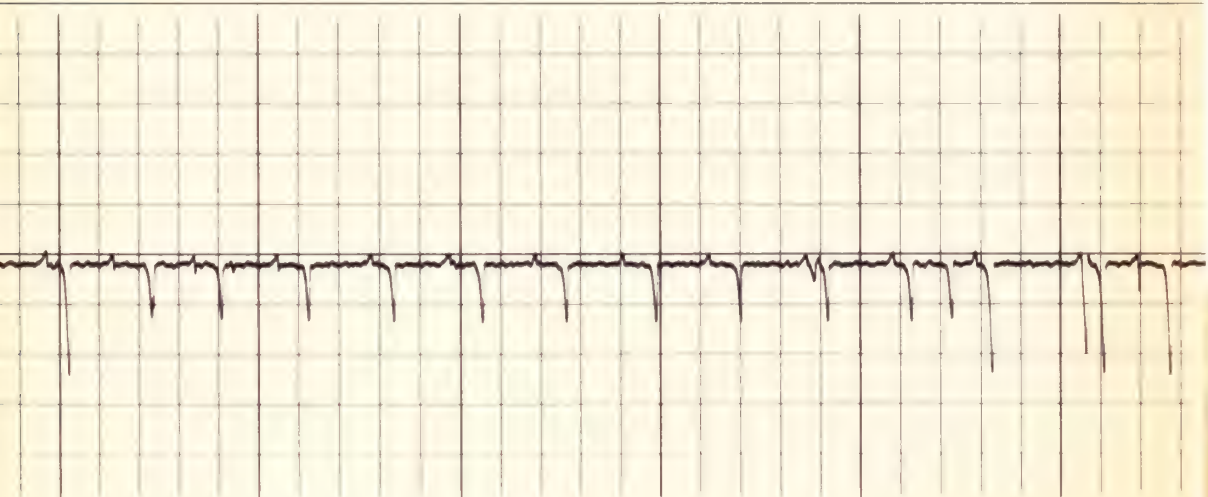
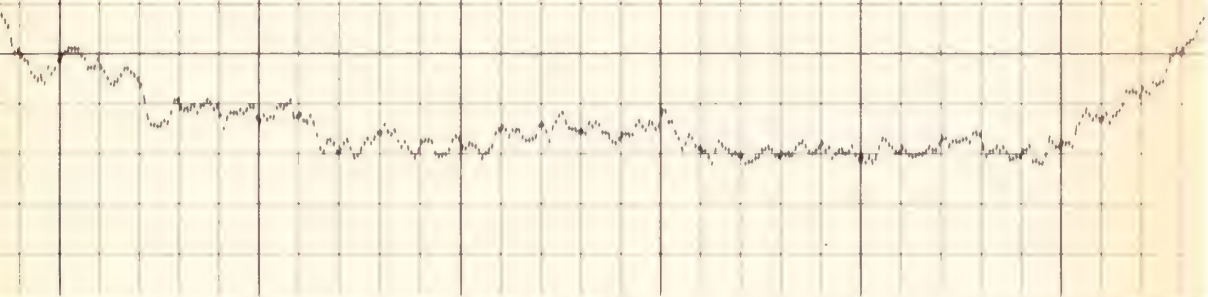
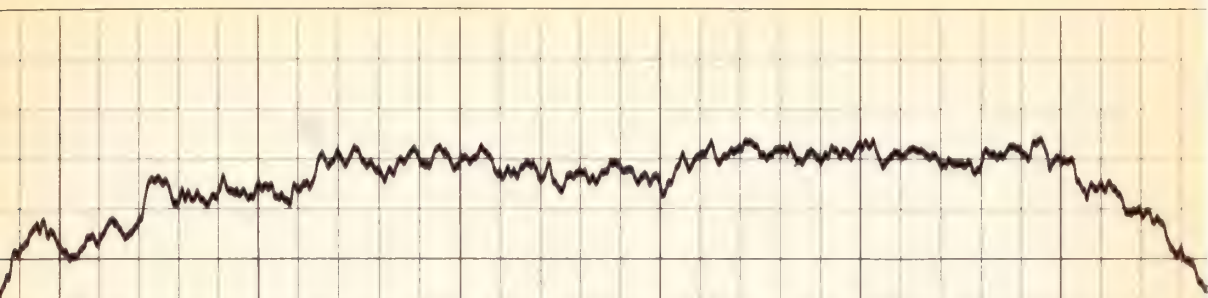


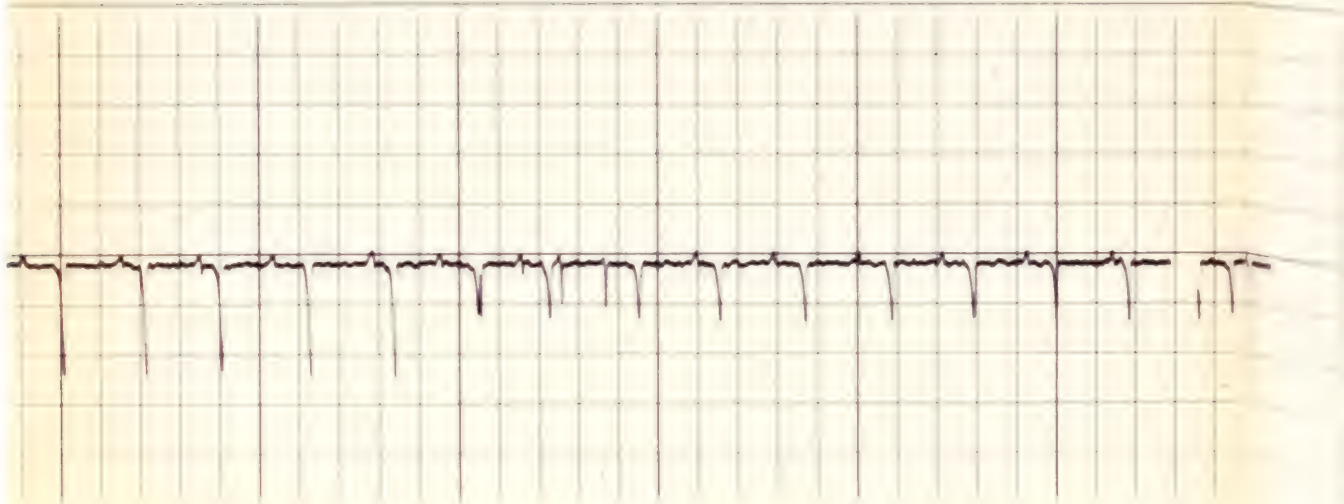
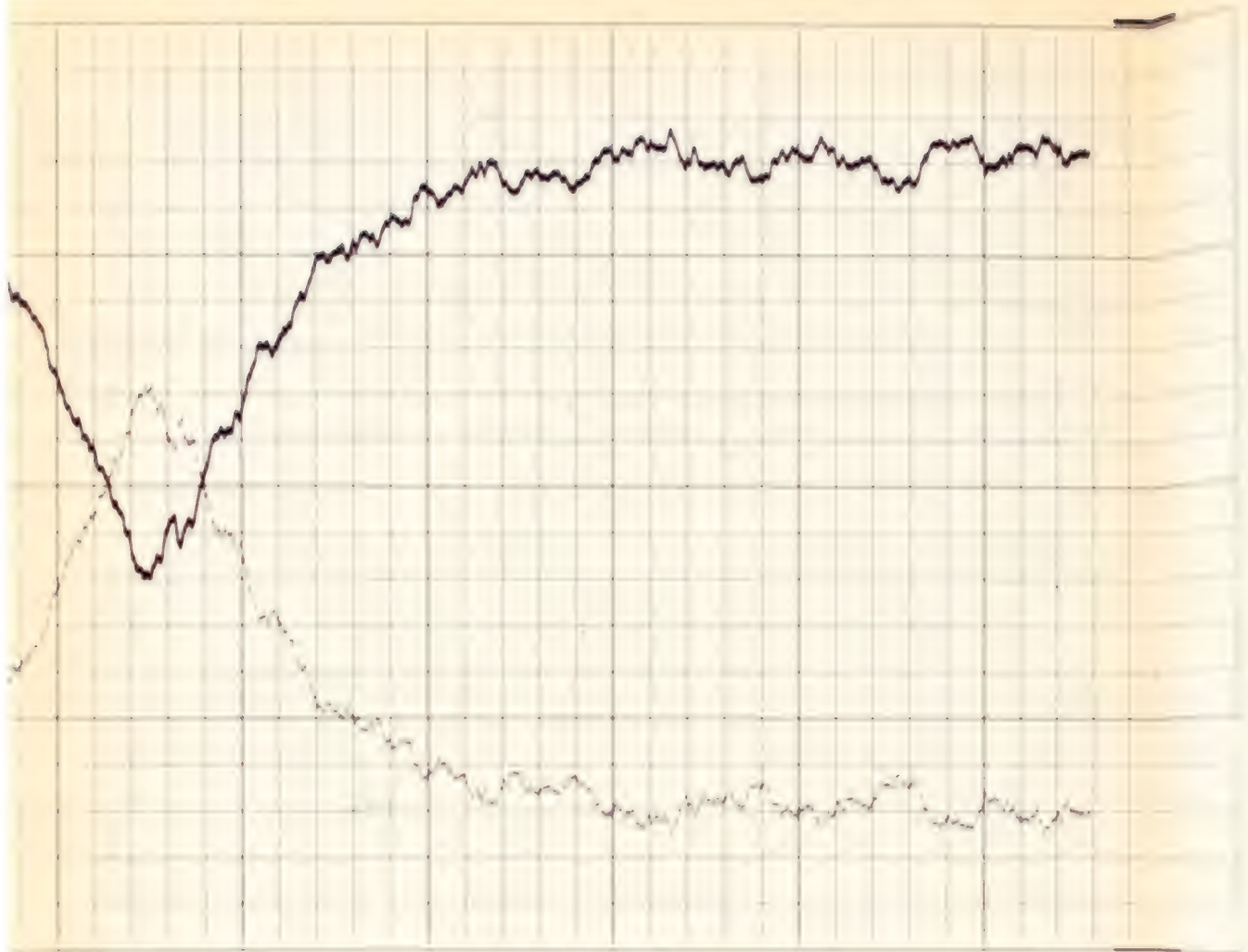
10.2-MIDDLE STRING
TYPICAL ORIENTING RECORD
GUN # 1 PERFORATED

1490-1500





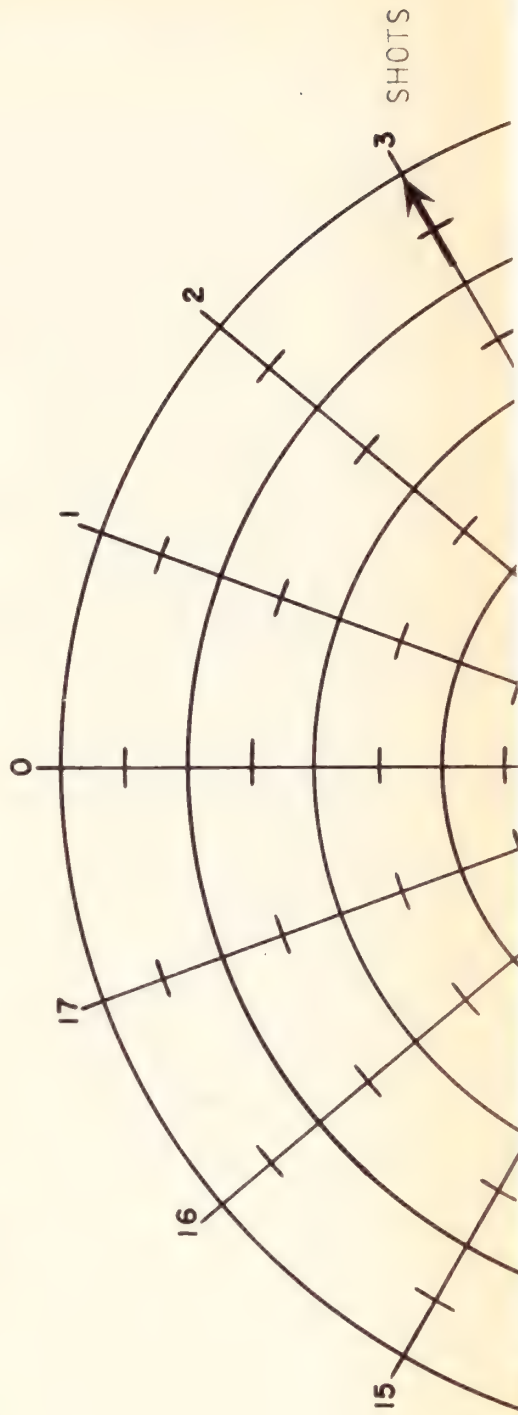


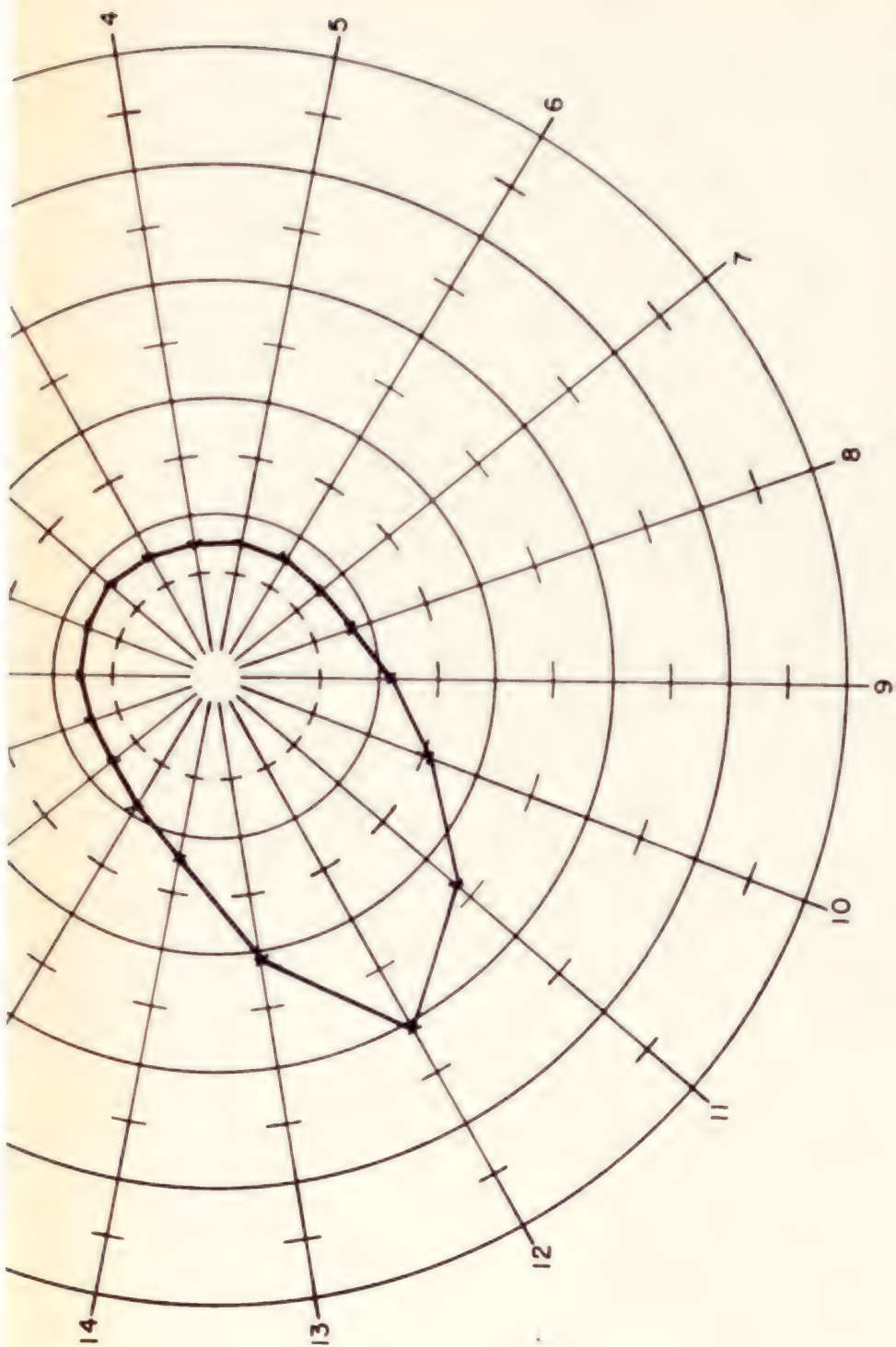


RADIO-ORIENTATION PLOT

POT-B

C.2 MIDDLE STRING PERFORATED 1490-1500 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





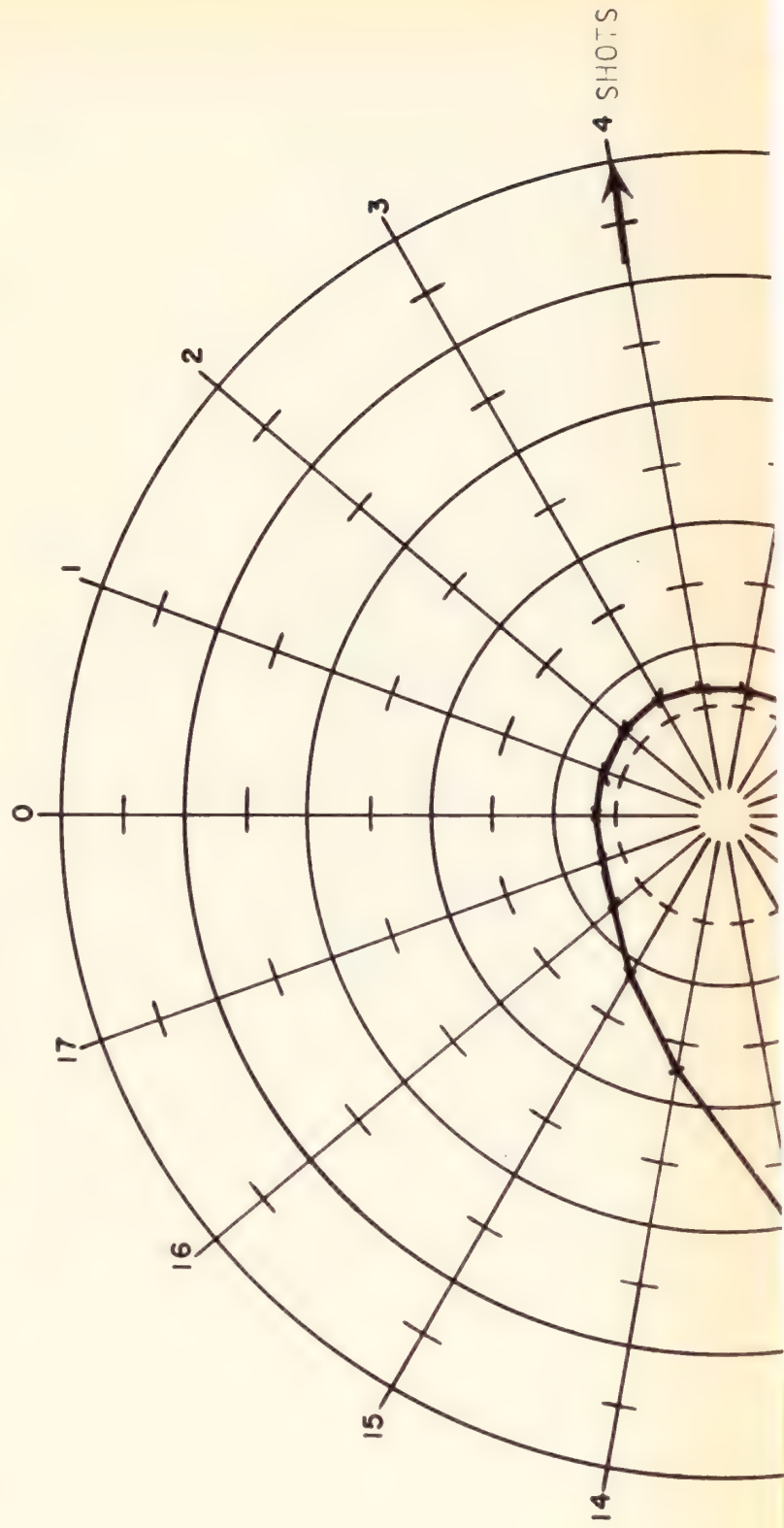
This chart, computation and or interpretation of our readings from our gamma gamma orientation and the testing instrument is presented to you in accordance with but subject to the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are set out on the reverse side of our Service Order for this job. The readings could be adversely affected by significant errors in the drill hole and other conditions unknown to us.

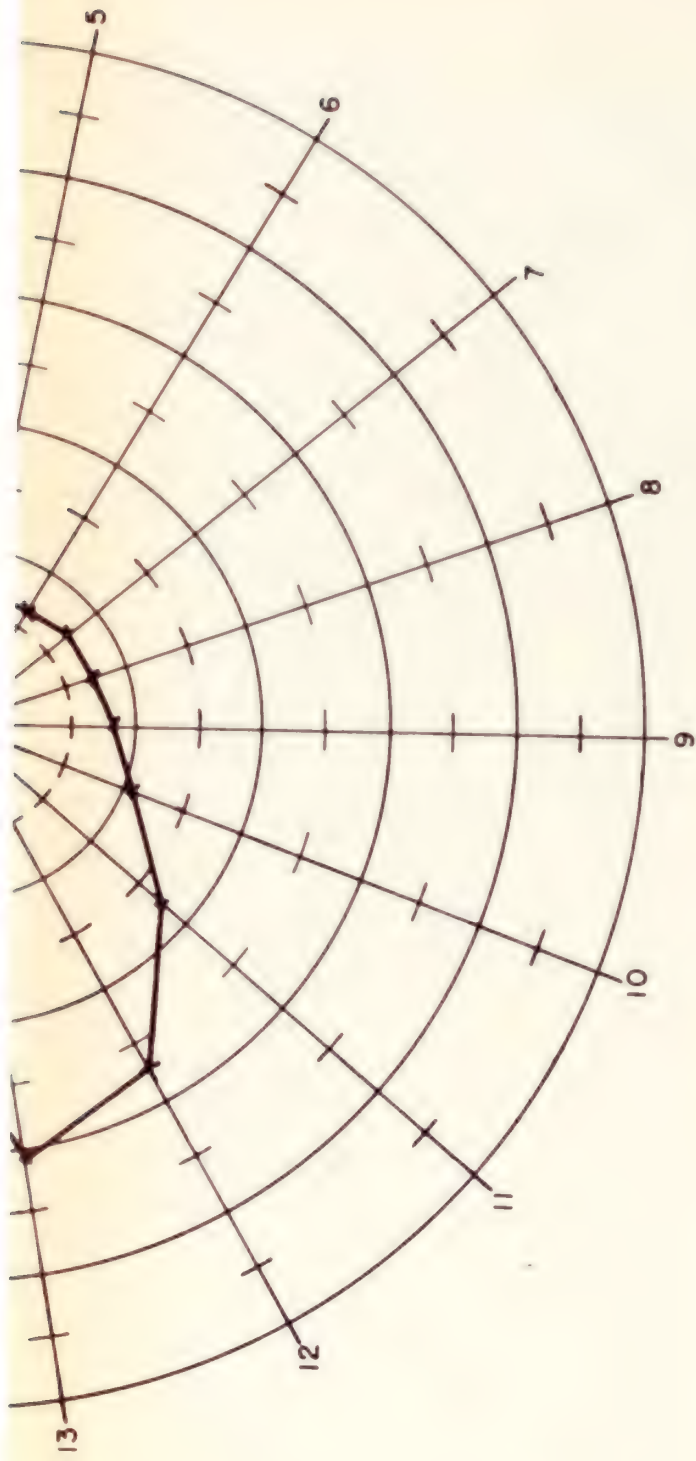
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

C. 2 MIDDLE STRING PERFORATED 1479 1489 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





Schlumberger

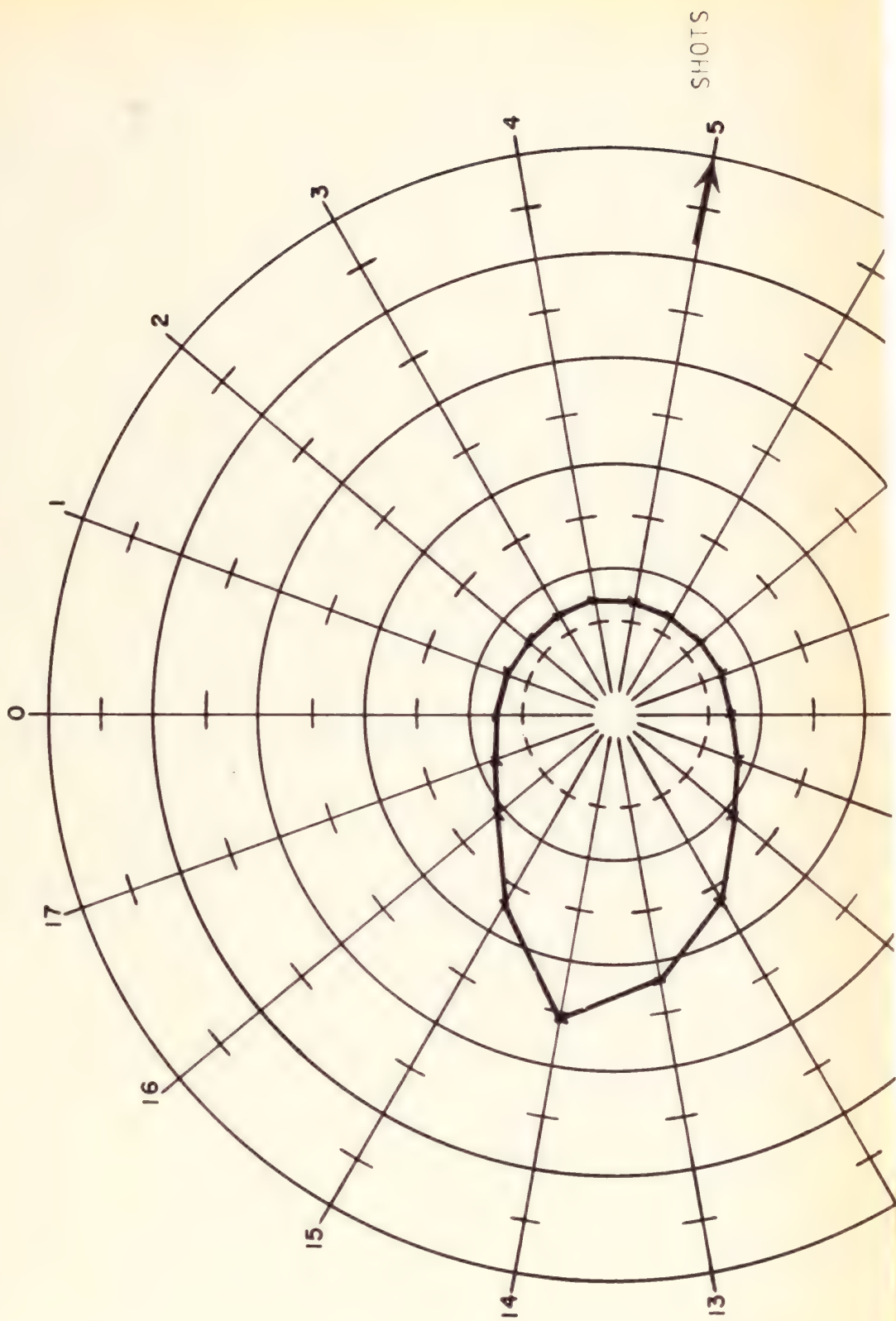
This chart, computation and/or interpretation of our readings from our gamma-gauging instrument and the
 lecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions,
 as are set out on pages 1 and 2 of our current Price Schedule and which are incorporated by reference
 side of our Service Order for this job. The readings could be adversely affected by various means of the
 drill hole and other conditions unknown to us.

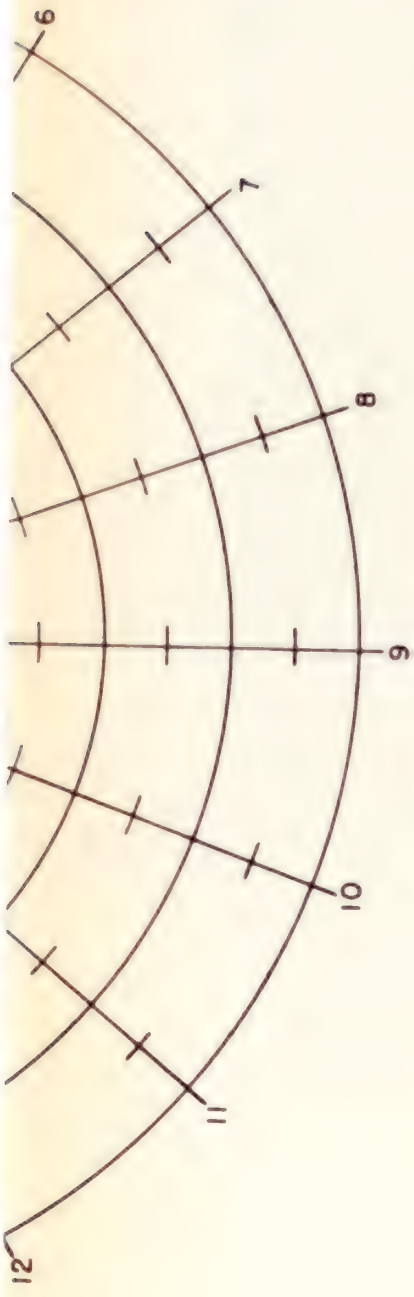
RADIO-ORIENTATION PILOT

RADIATION FLU

POT-B

30.2 MIDDLE STRING PERFORATED 1468-1478 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma spectrometer and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are set out on the reverse side of our Service Order for this job. The readings could be adversely affected by significant changes in the drill hole and other conditions unknown to us.

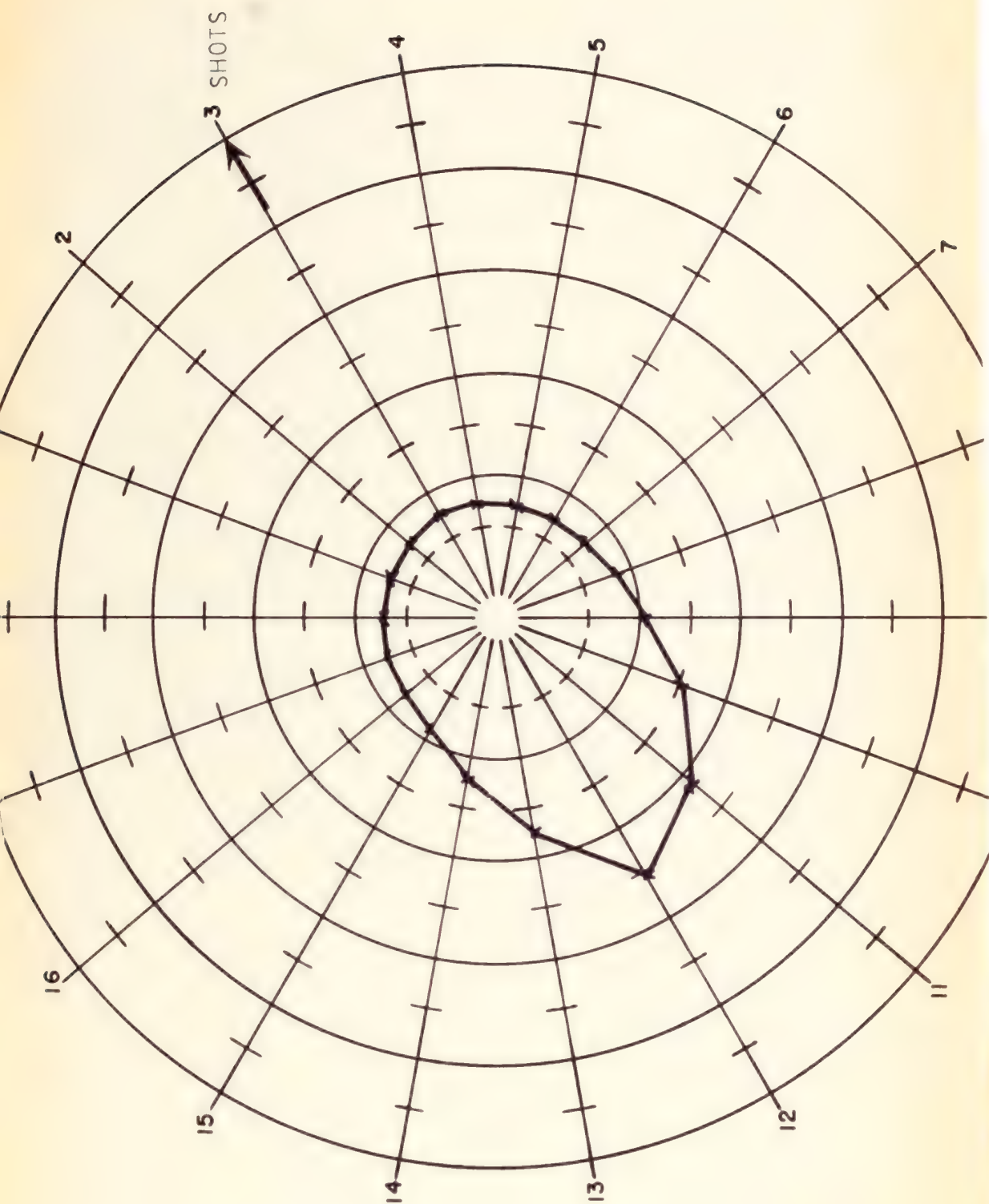


RADIO-ORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1457-1467 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





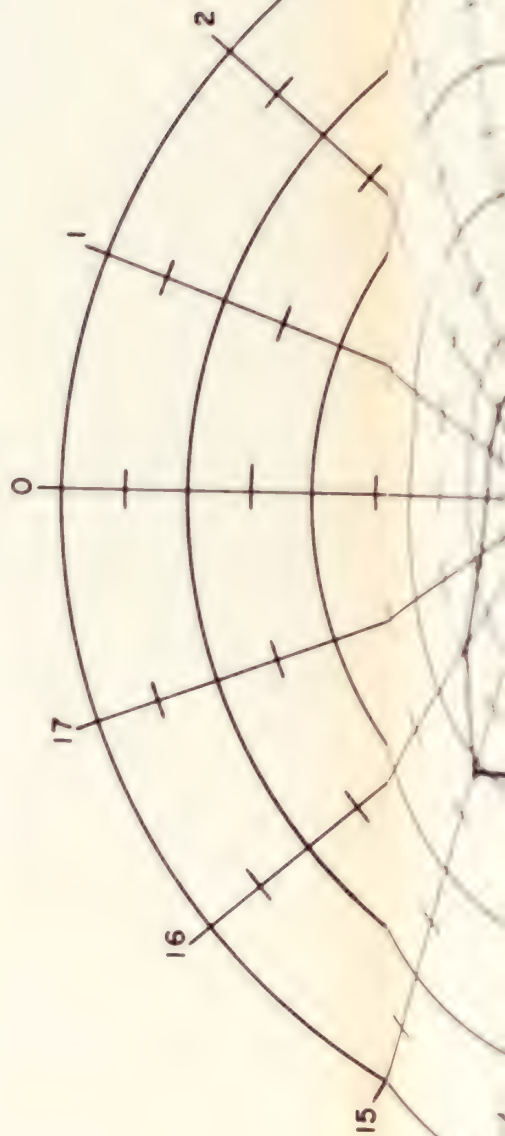
This chart, computation and/or interpretation of our readings from our gamma gamma detector and its
 logging instrument is presented to you in accordance with but subject to the General Terms and Conditions
 as are set out on pages 1 and 2 of our current price schedule and which are to be put on the same
 side of our Service Order for this job. The readings could be adversely affected by unknown mud in the
 drill hole and other conditions unknown to us.

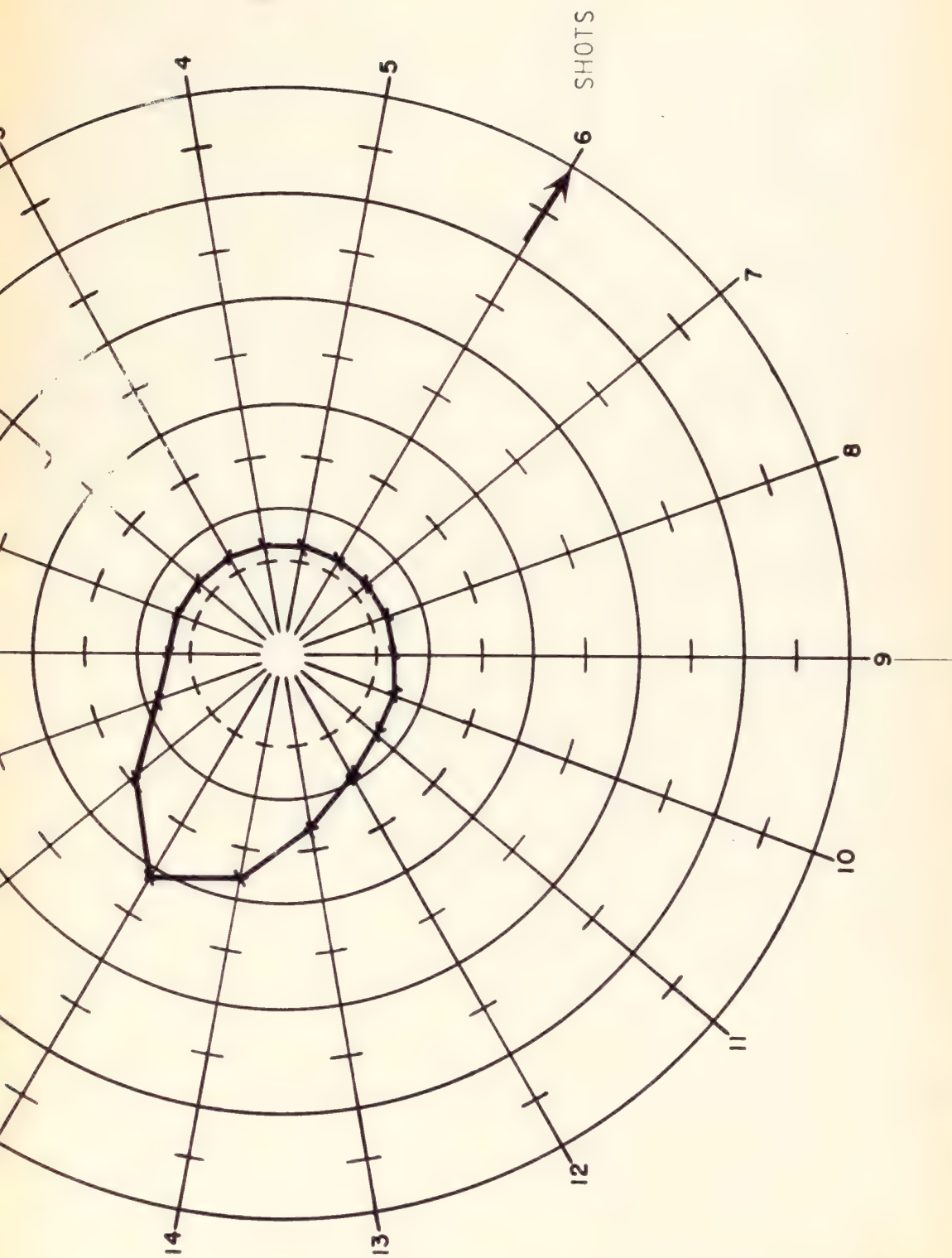
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1440-1490 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

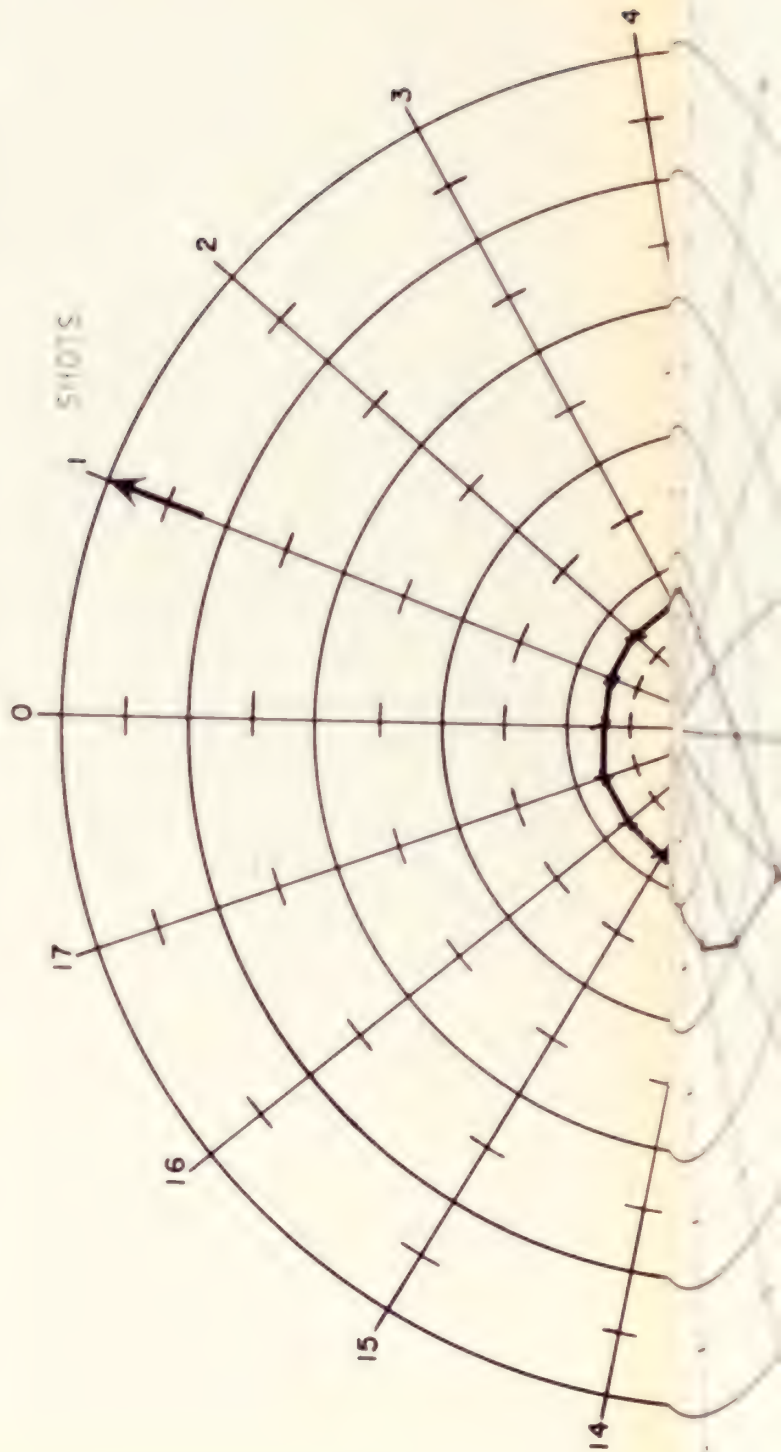


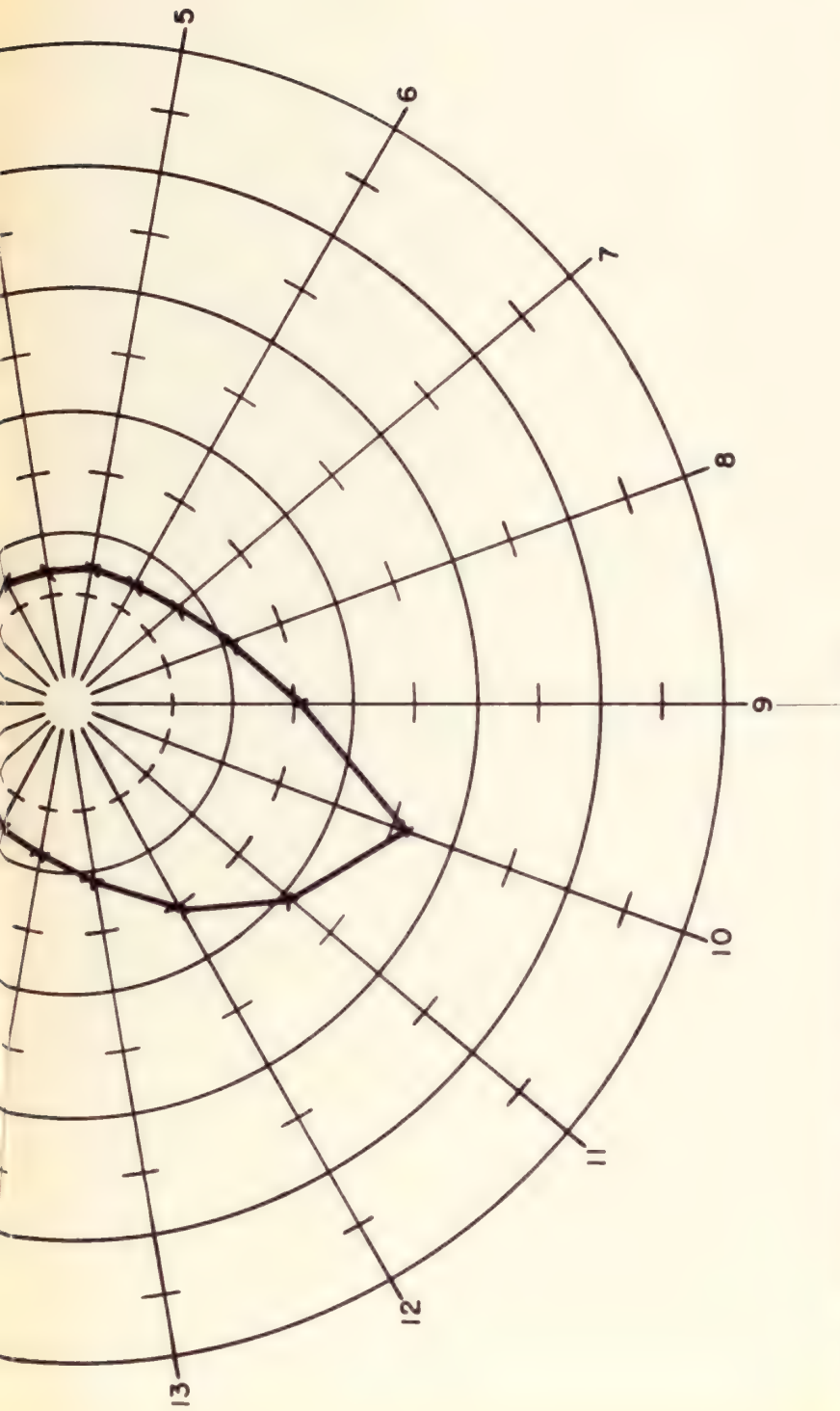


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse

POT-B

100-2-MIDDLE STAINING SEPARATED: 1435-1445 ONE SHOT OF 11-160 IMPROVED

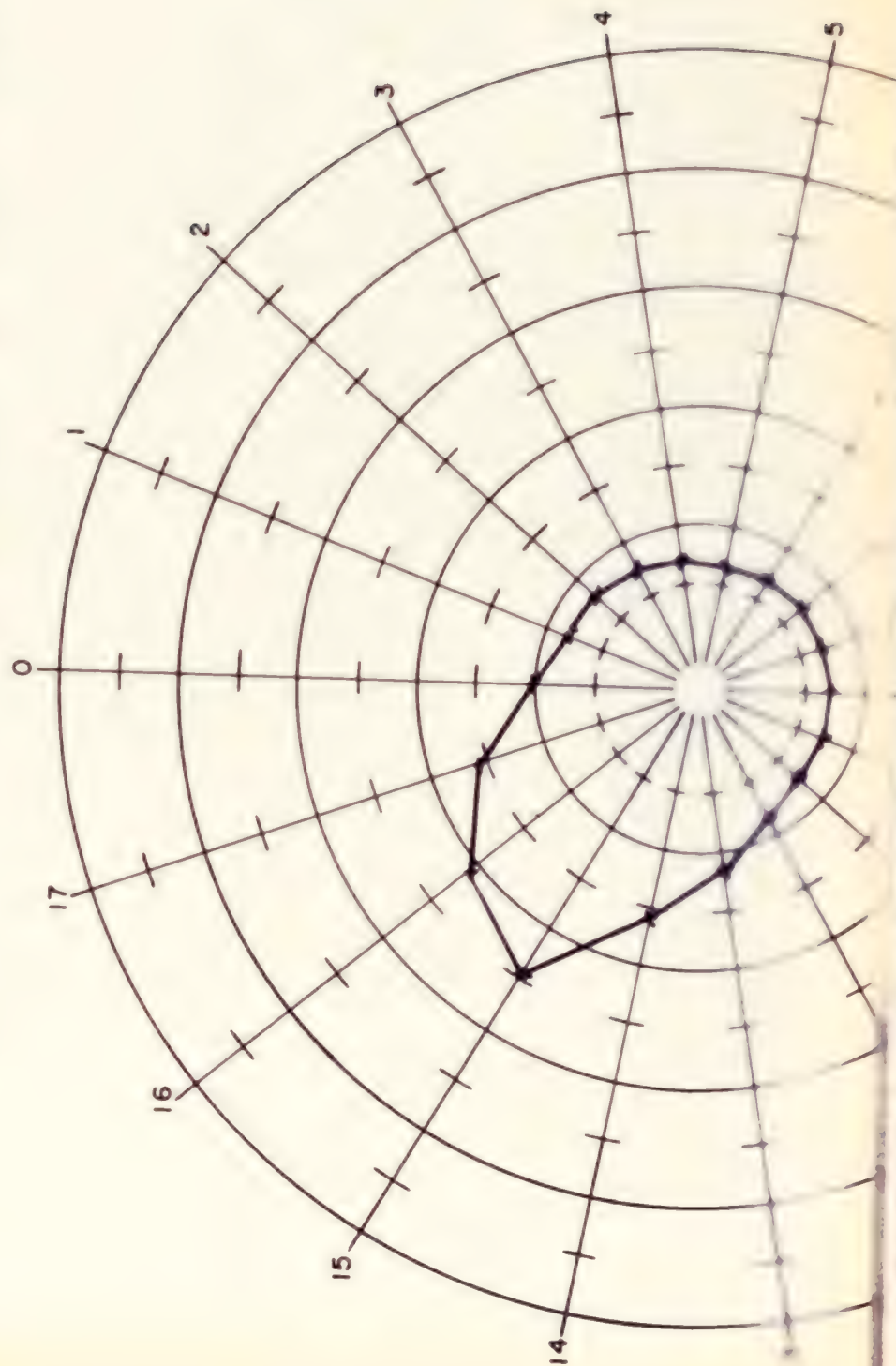


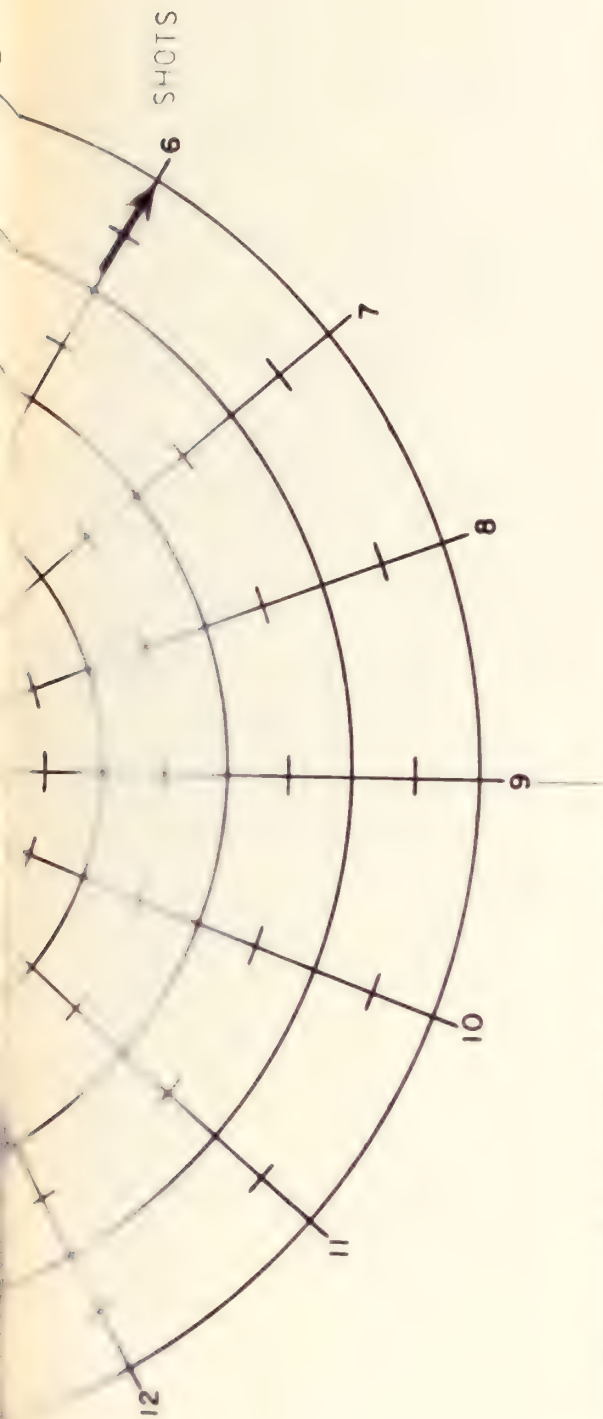


chart, computation and/or interpretation of our readings from our gamma-gamma orientation and de
ing instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
of our Service Order for this job. The readings could be adversely affected by variant metal in the
hole and other conditions unknown to us.

RADIOORIENTATION PLOT

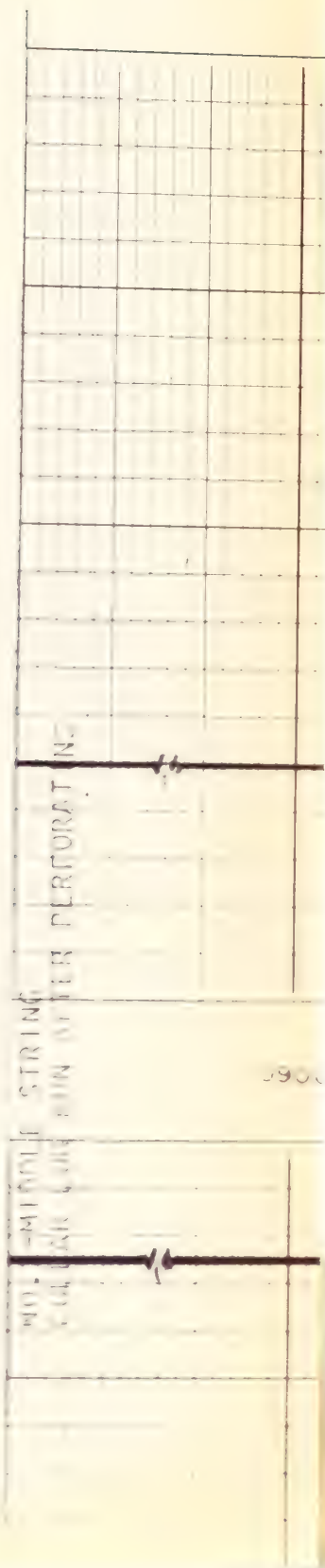
2. MIDDLE STRING PERFORMED. 1430-1435. ONE SHOT PER FOOT WITH 1.1X1600 HPSR00ME
POT-B

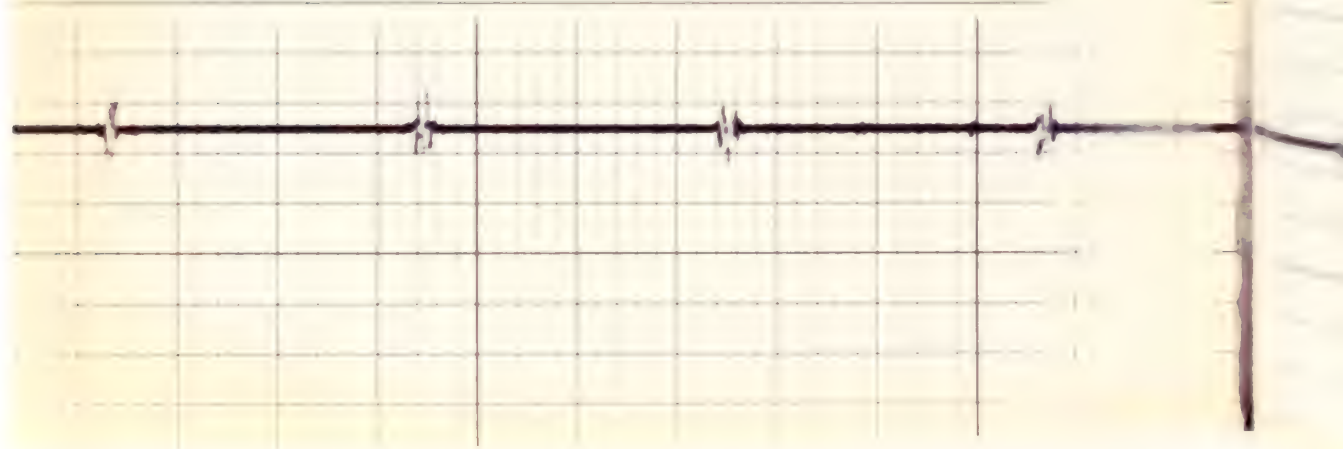
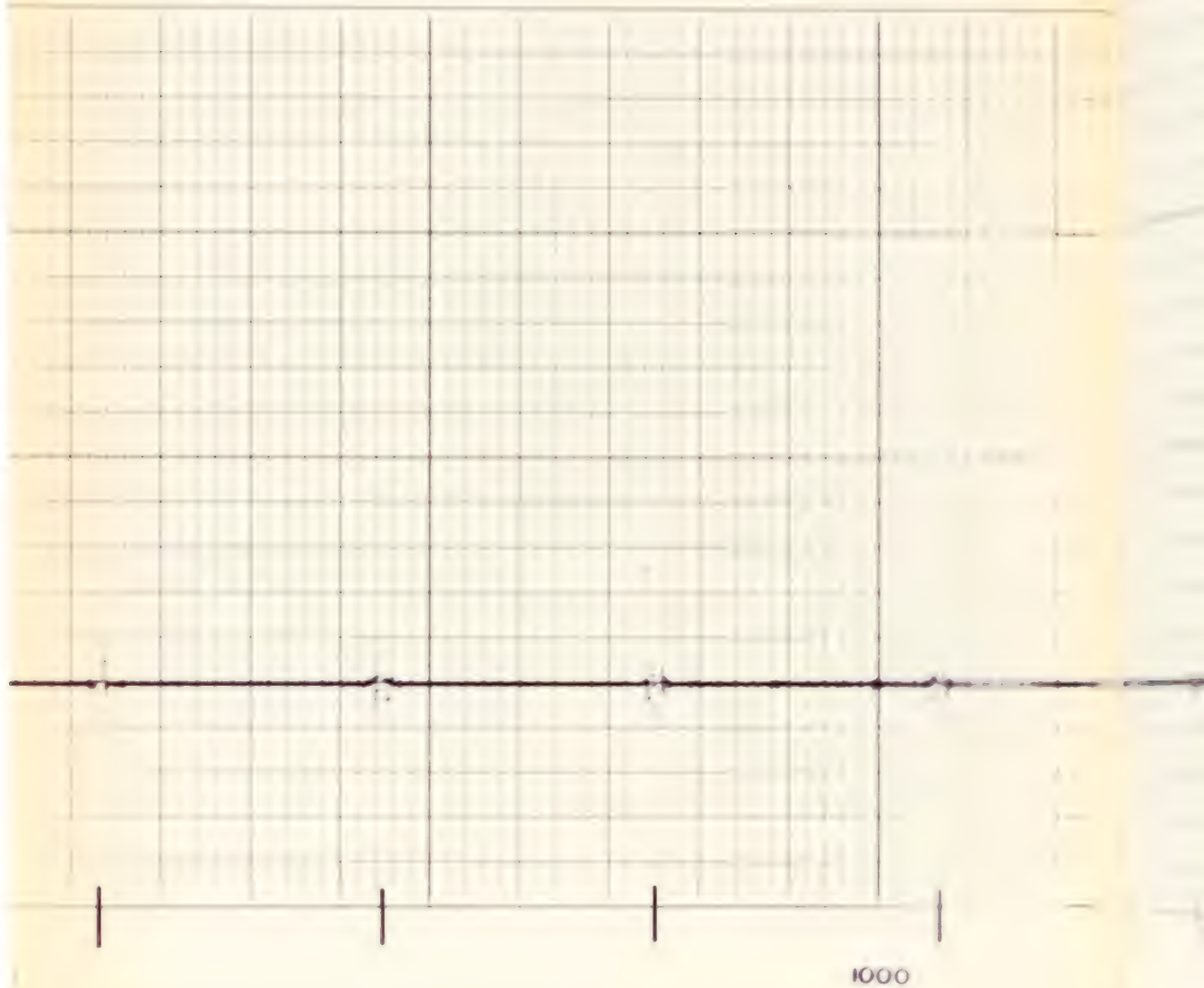


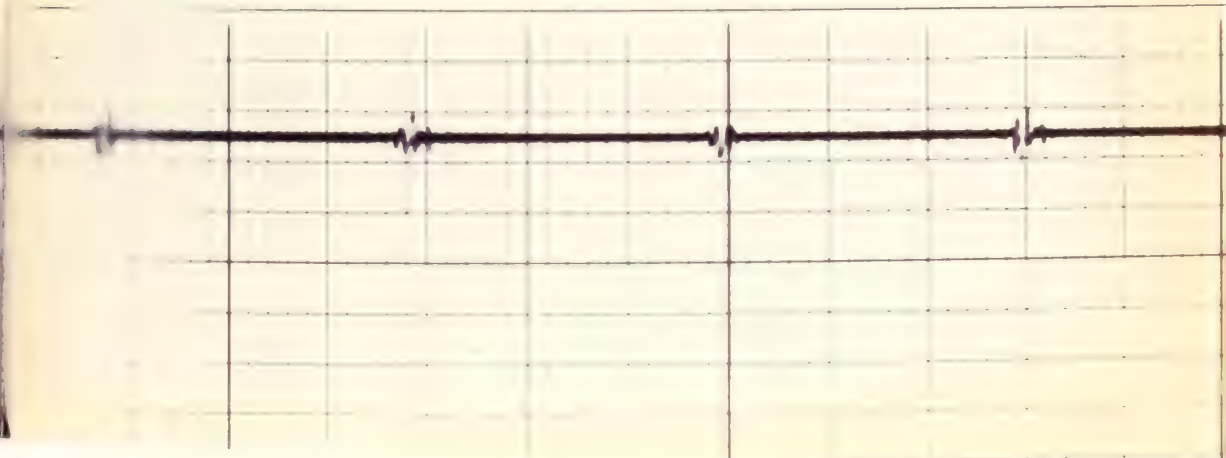
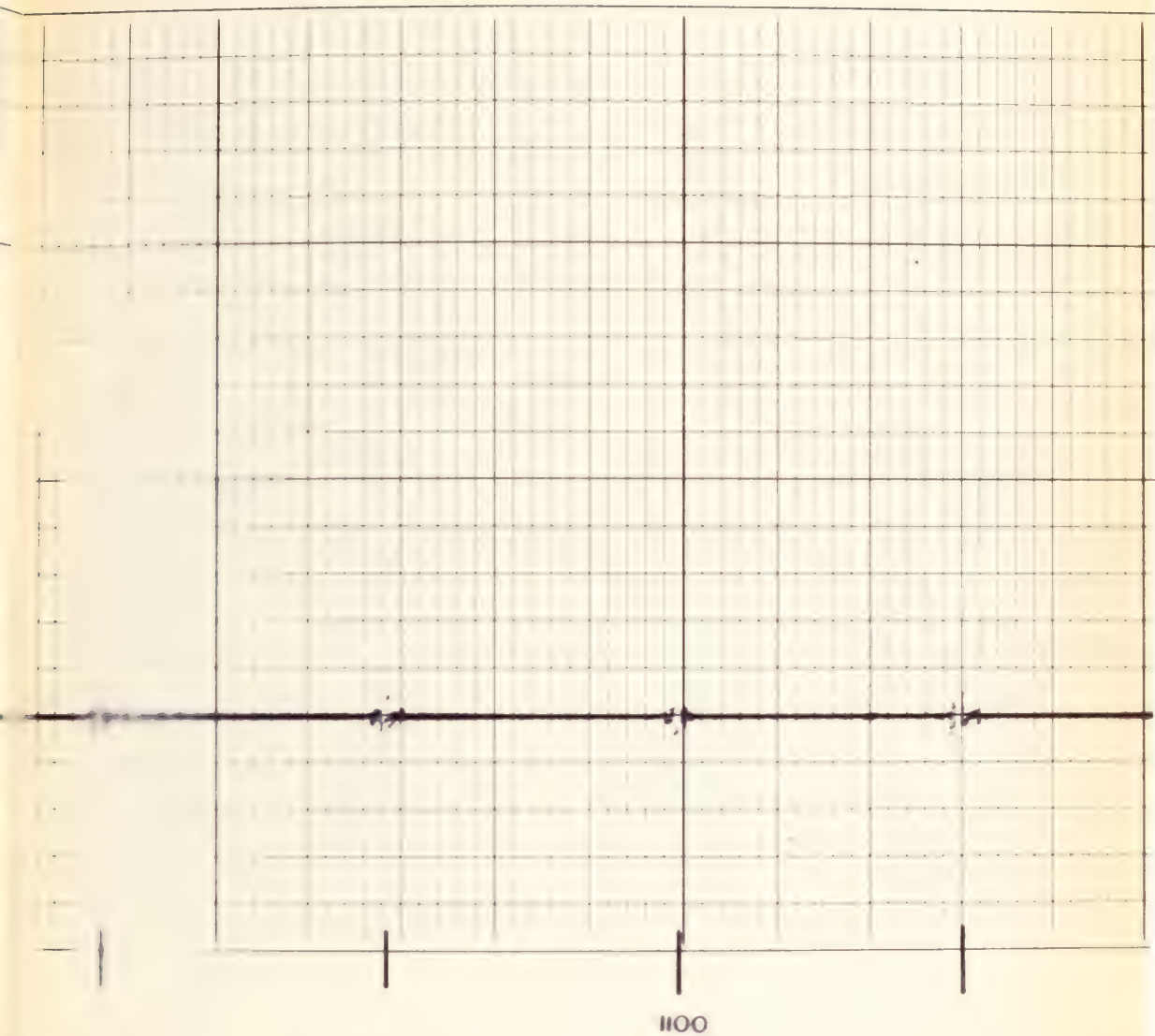


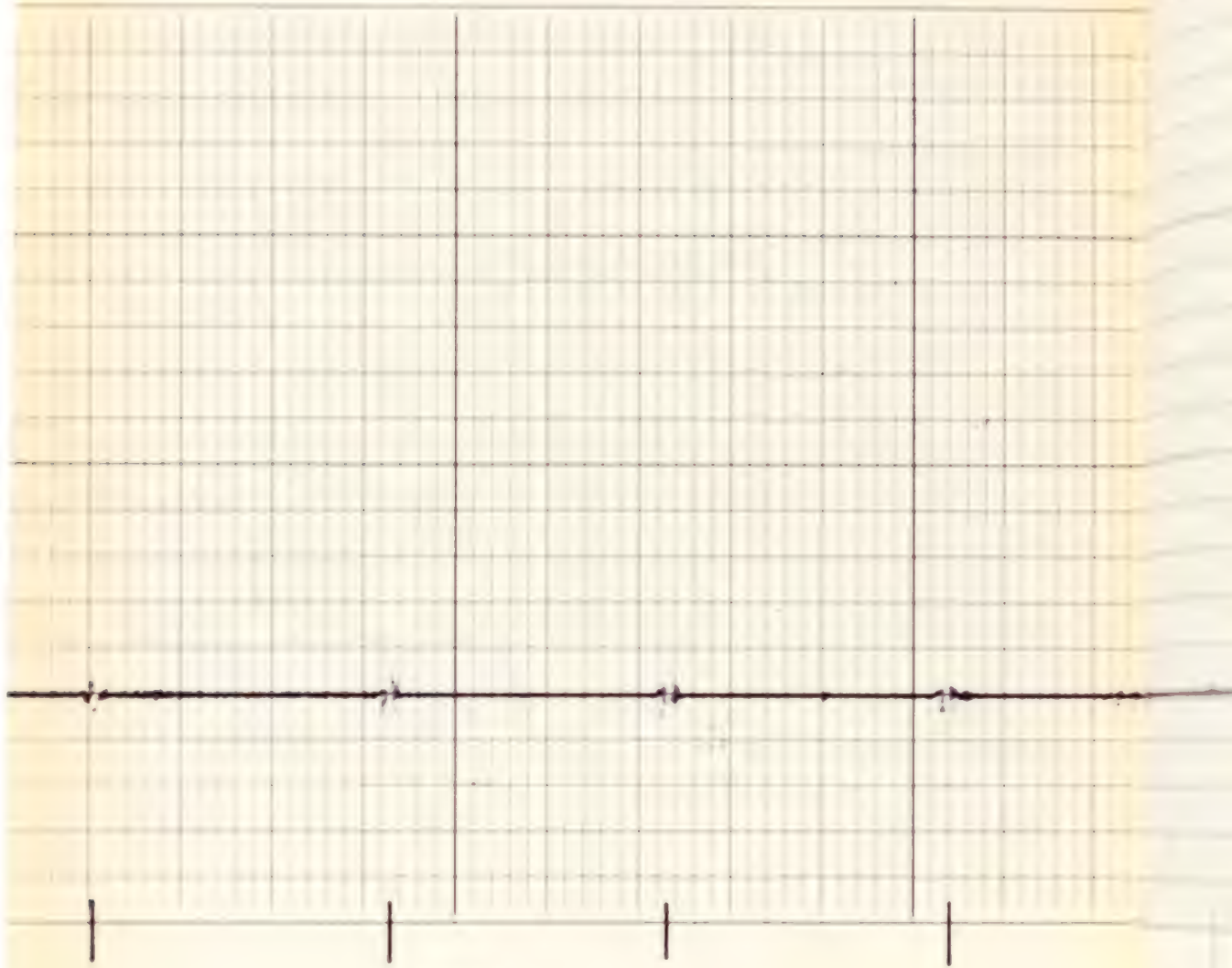
not completion and or interpretation of our readings from our gamma gamma orientation and de-
 statement is presented to you in accordance with but subject to the General Terms and Conditions
 set out on pages 1 and 2 of our current Price Schedule and which are set out in the reverse
 of Section Order for this job. The readings could be adversely affected by various metal in the
 site and other conditions unknown to us

Schlumberger

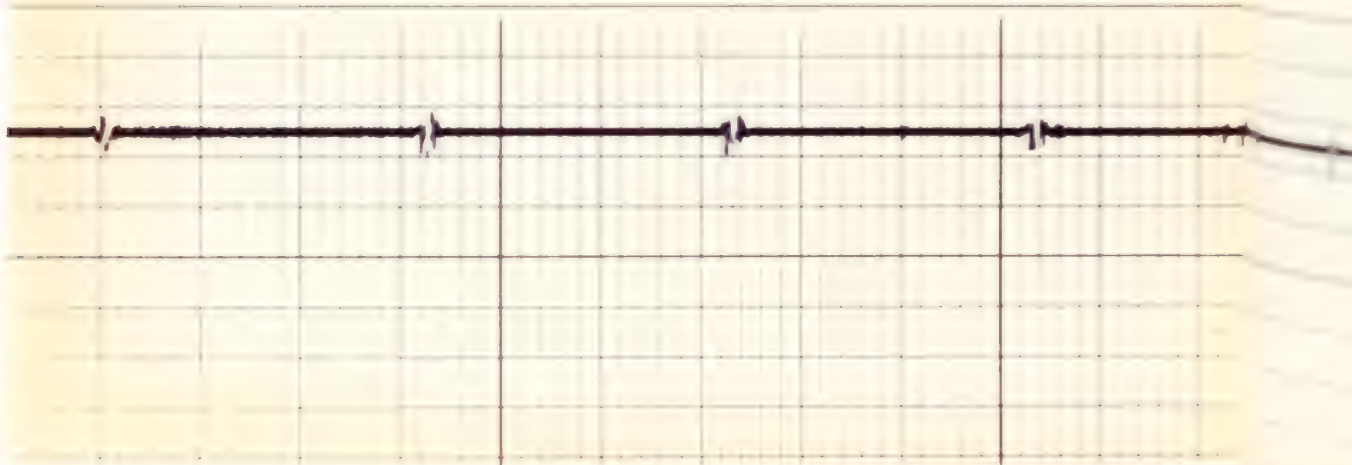


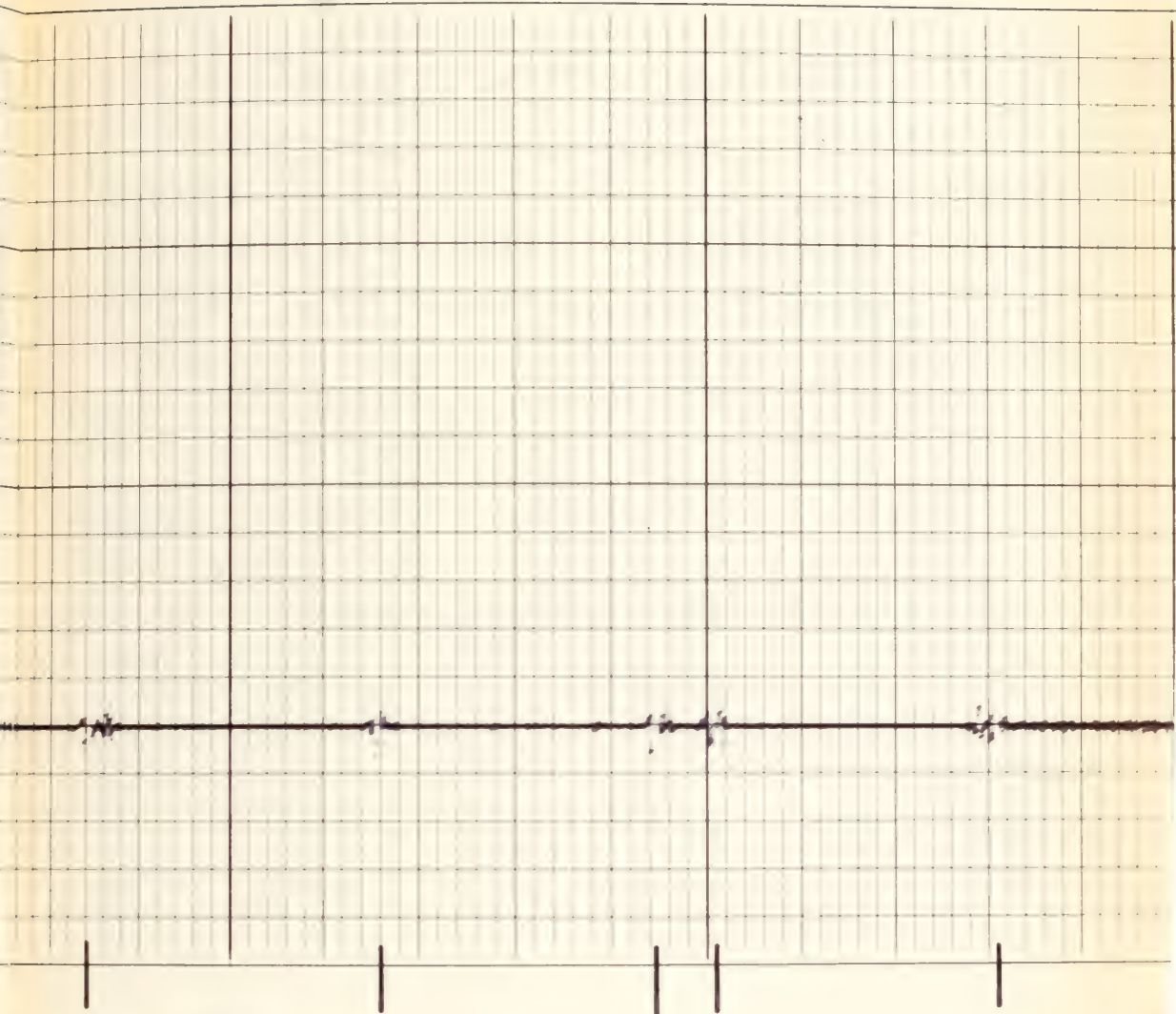






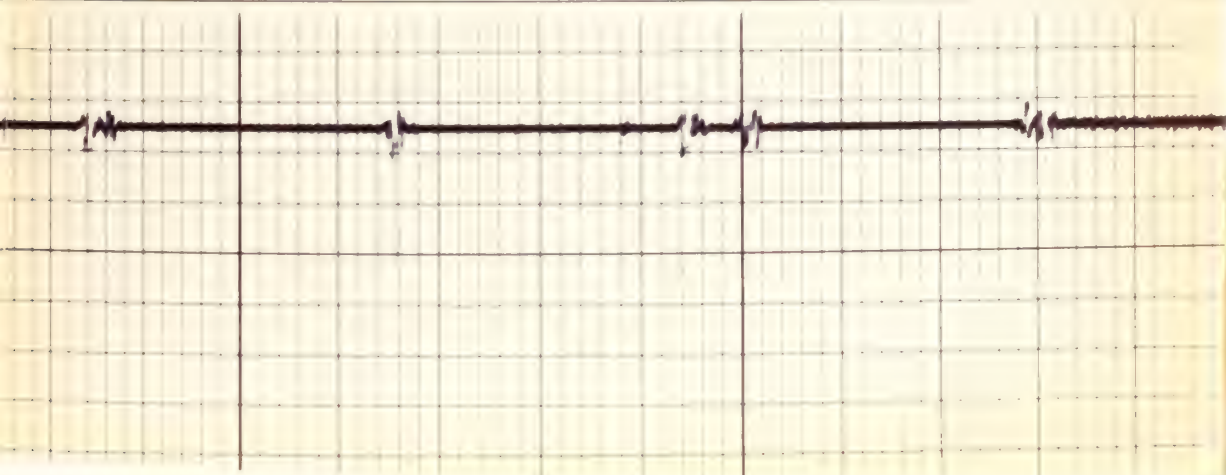
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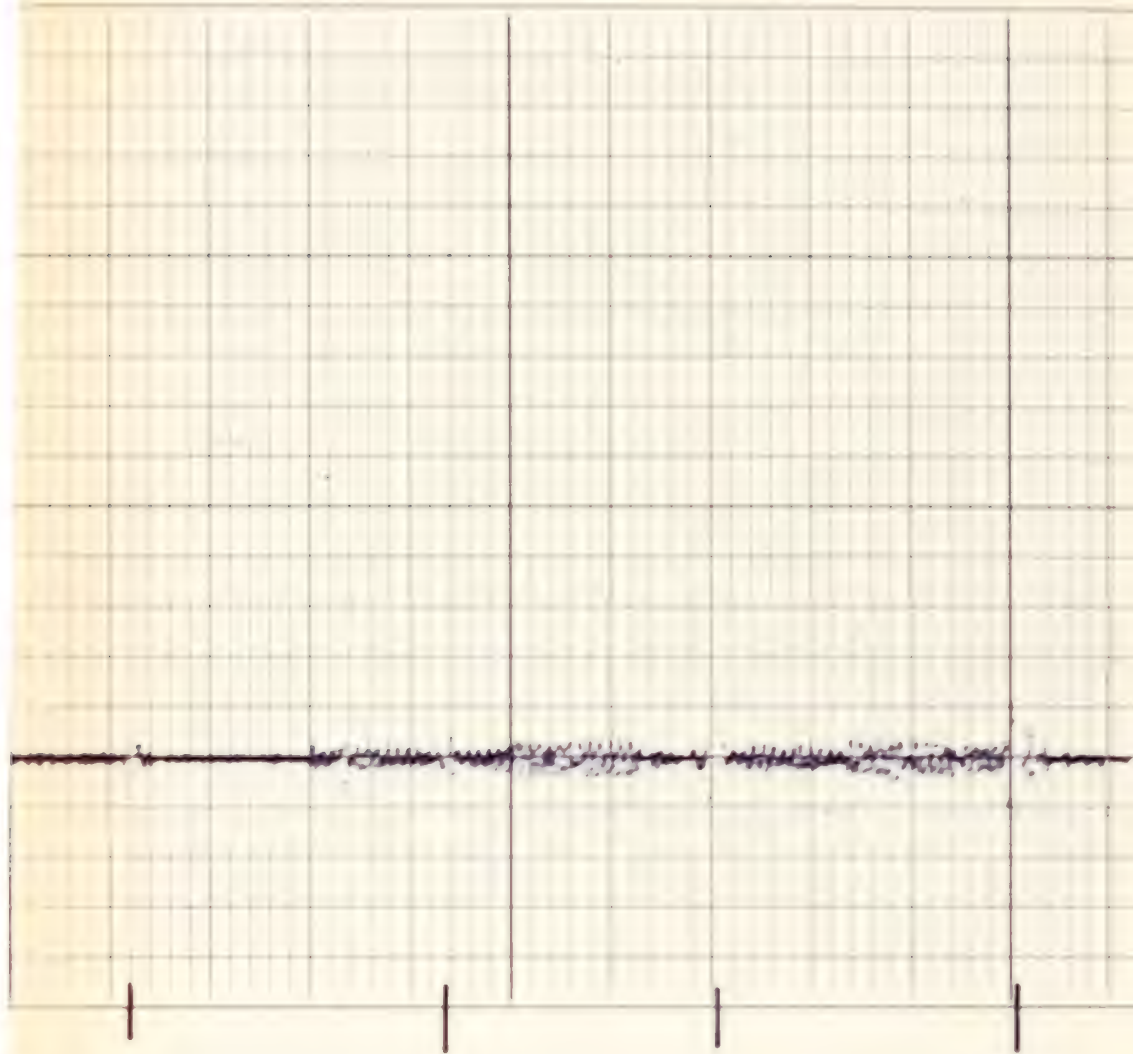




1300

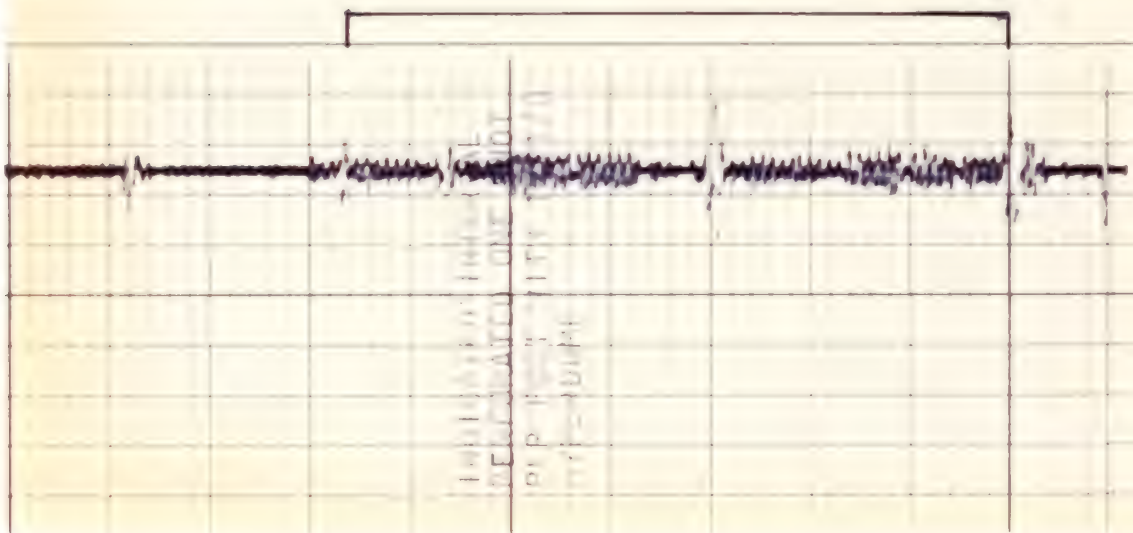
14





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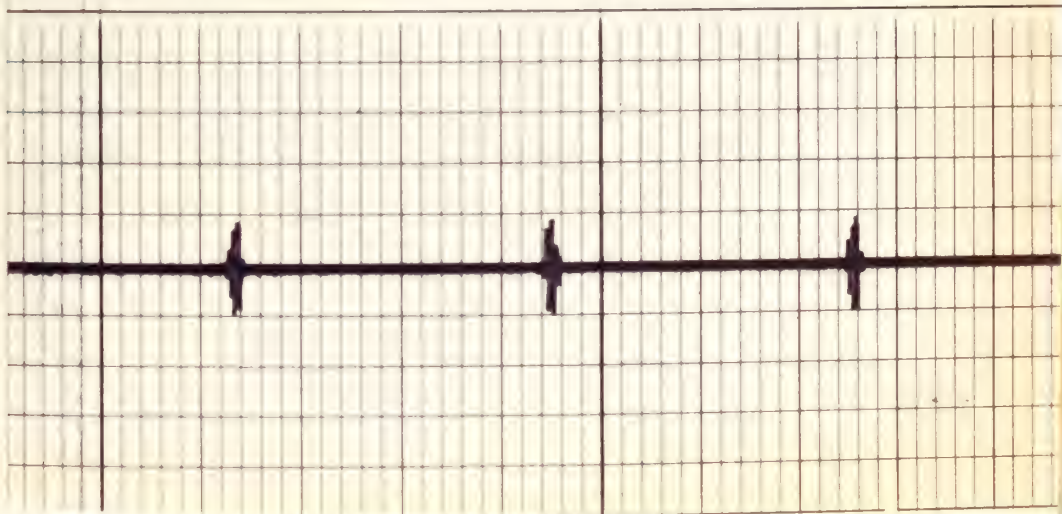
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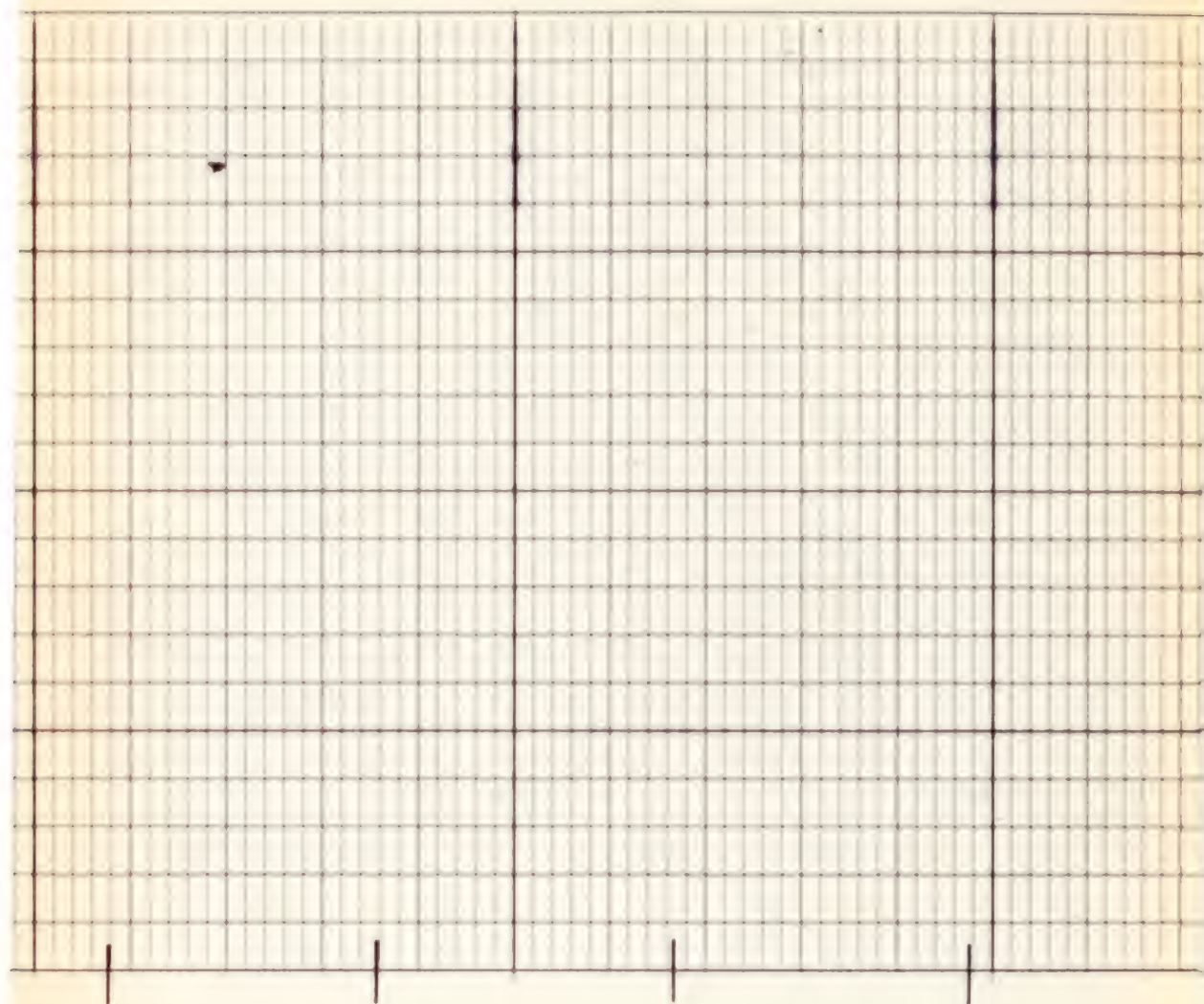


RECORDED ONE
100 P. 11/11/70
11/11/70

AT JIC NO. 3 - SHORT STRING
COLLAR LOG RUN BEFORE PERFOATING

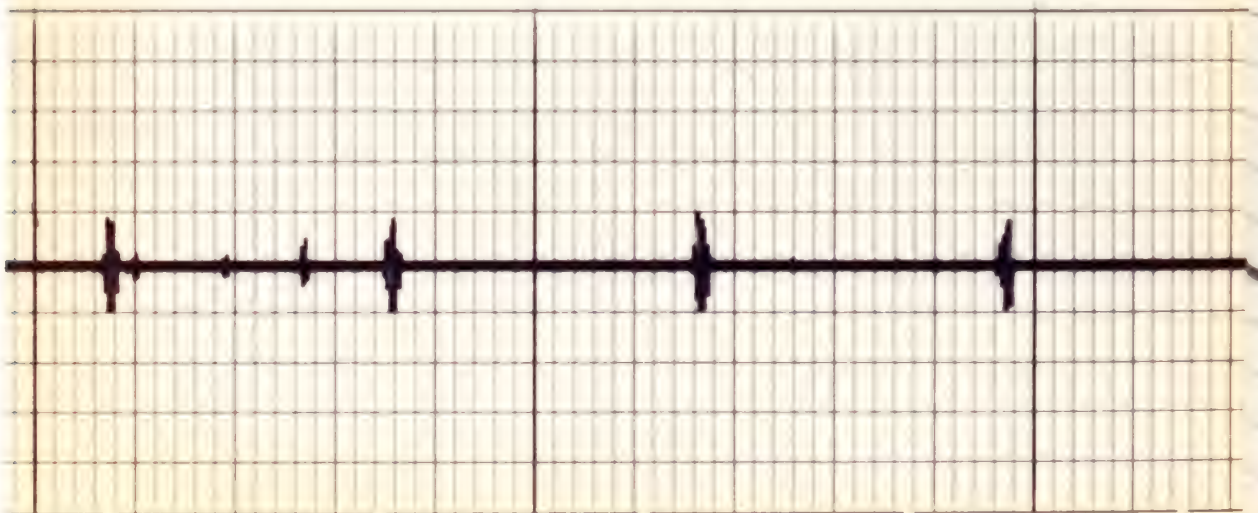
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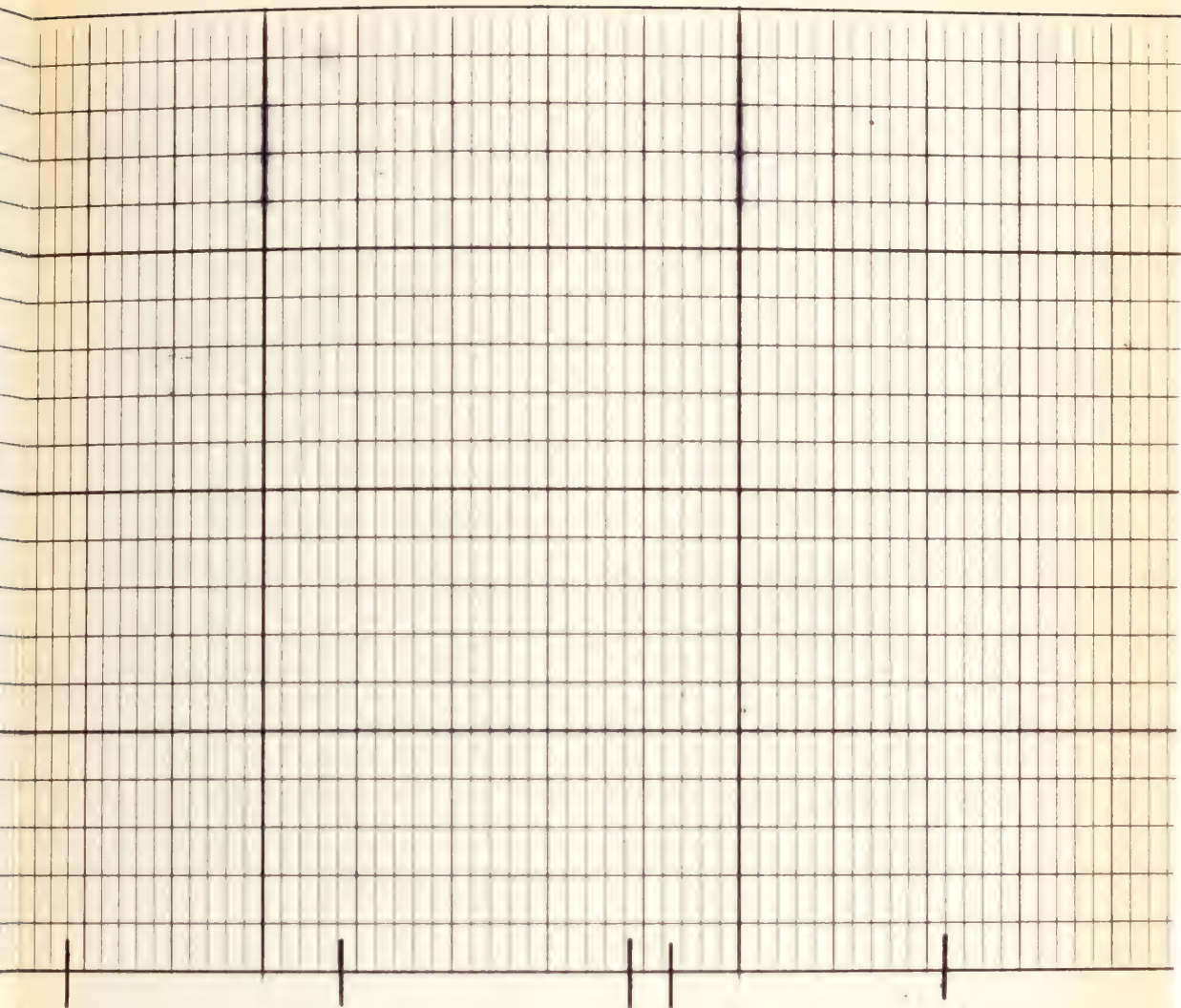




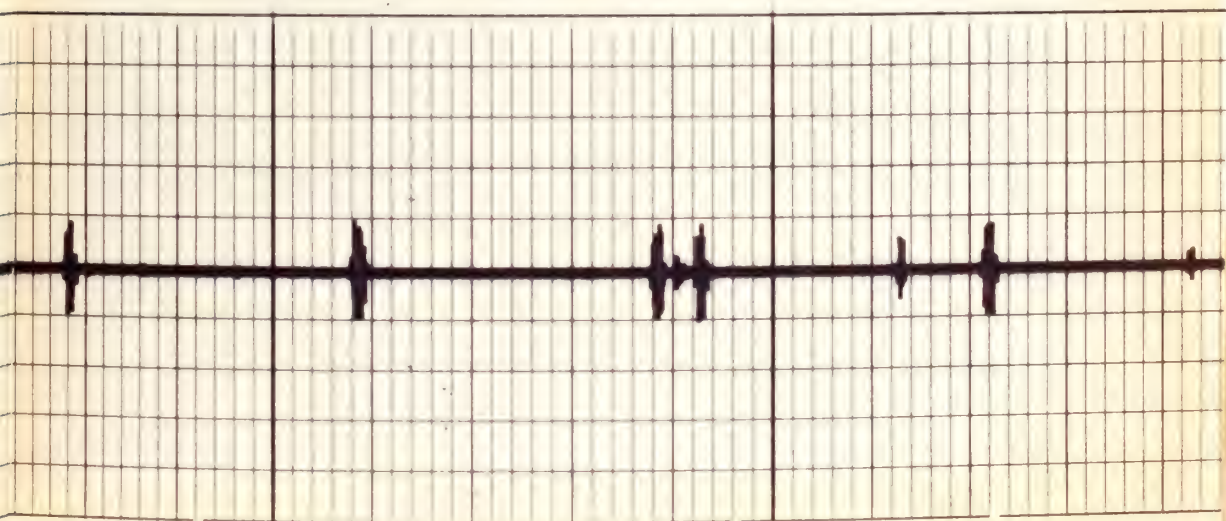
1000

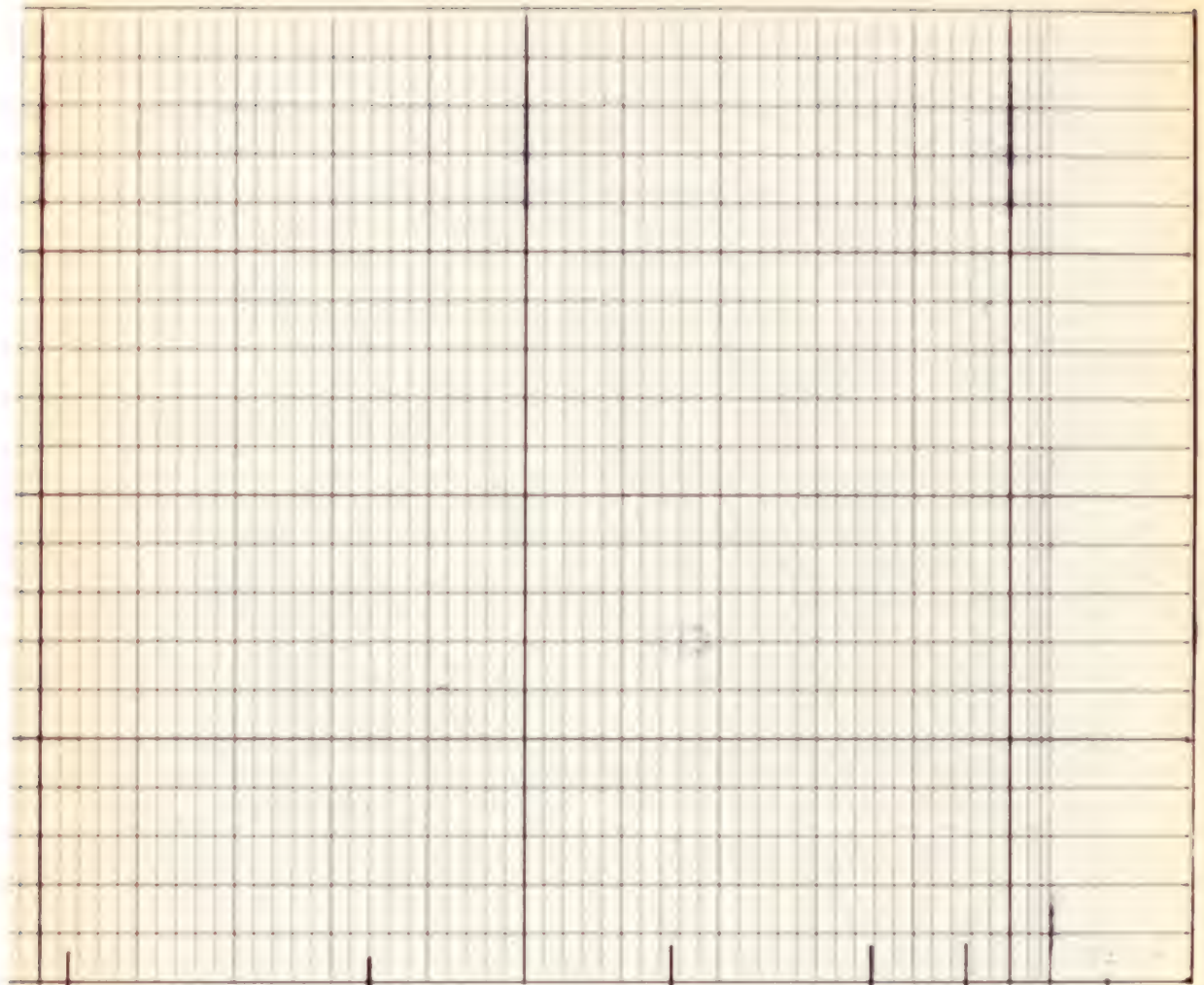
100





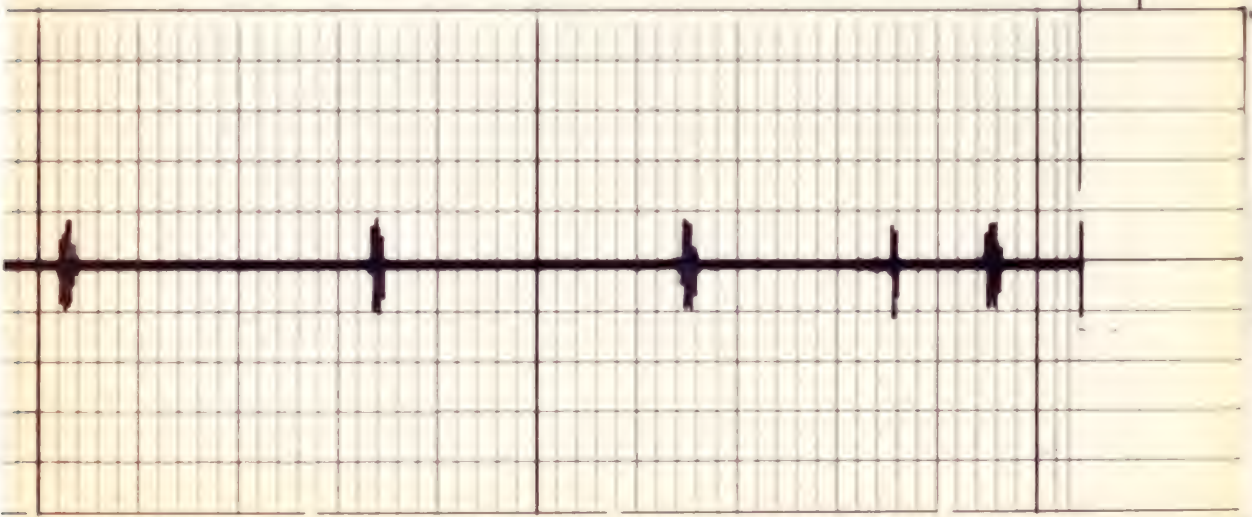
1200





1300

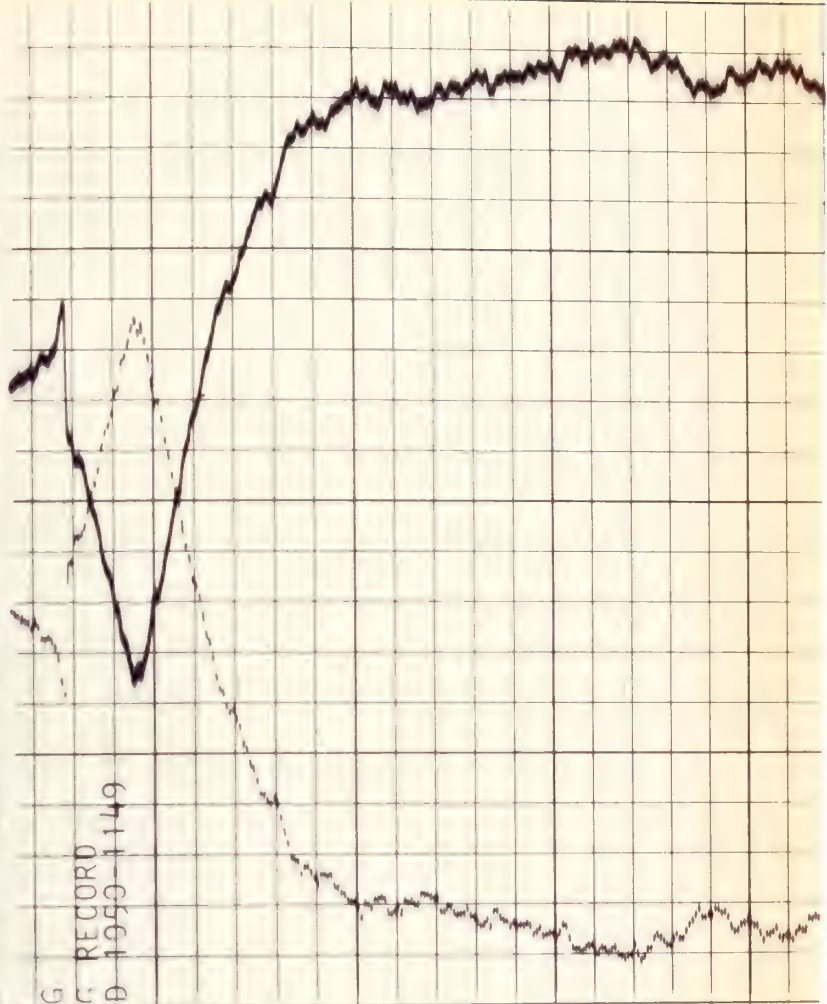
F.R.

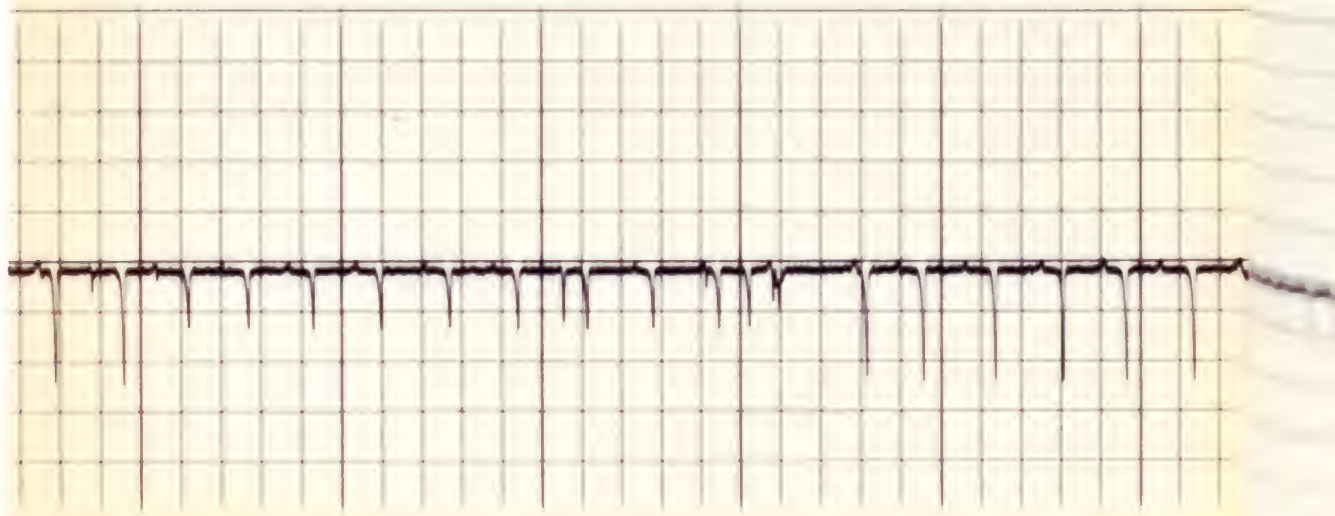
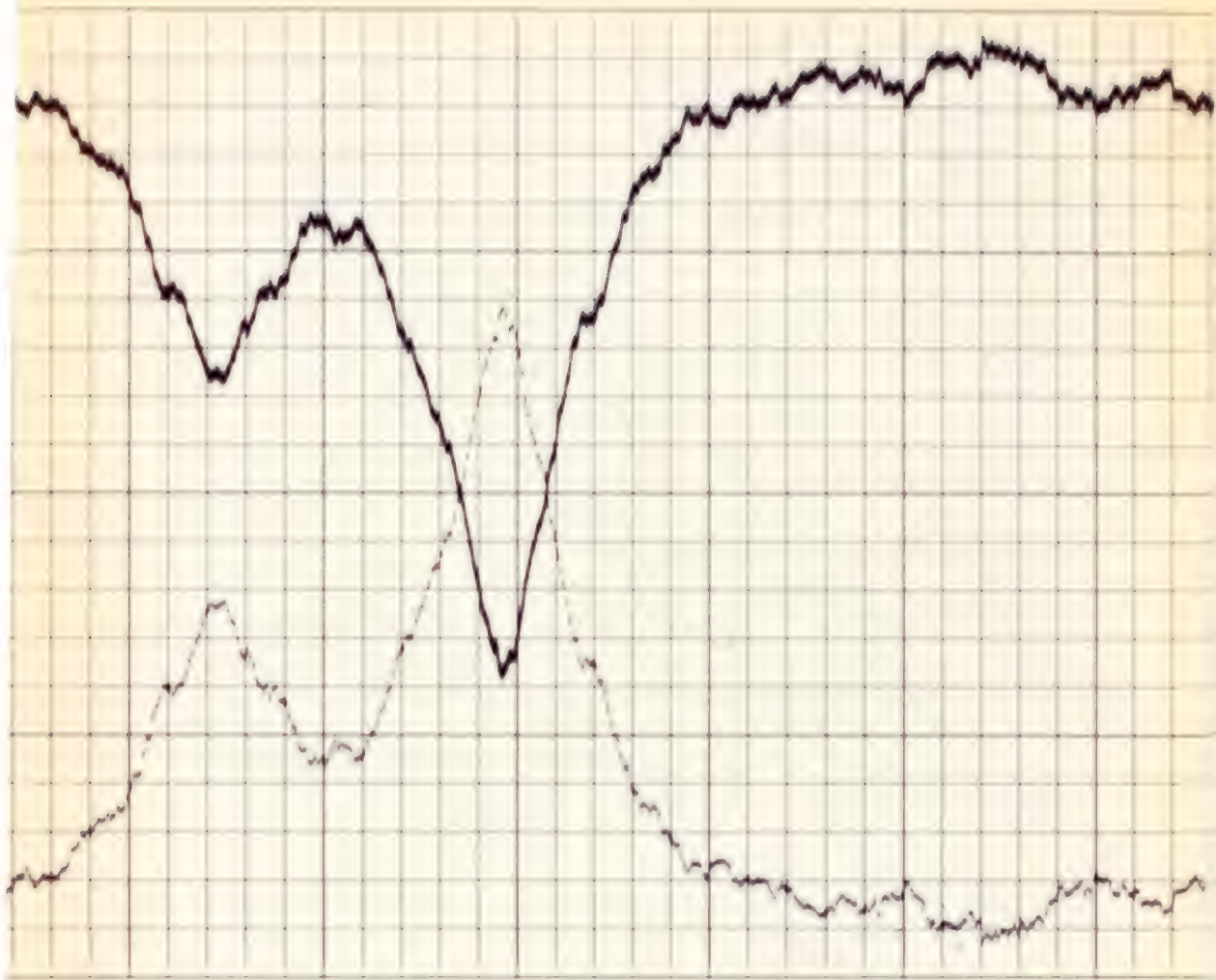


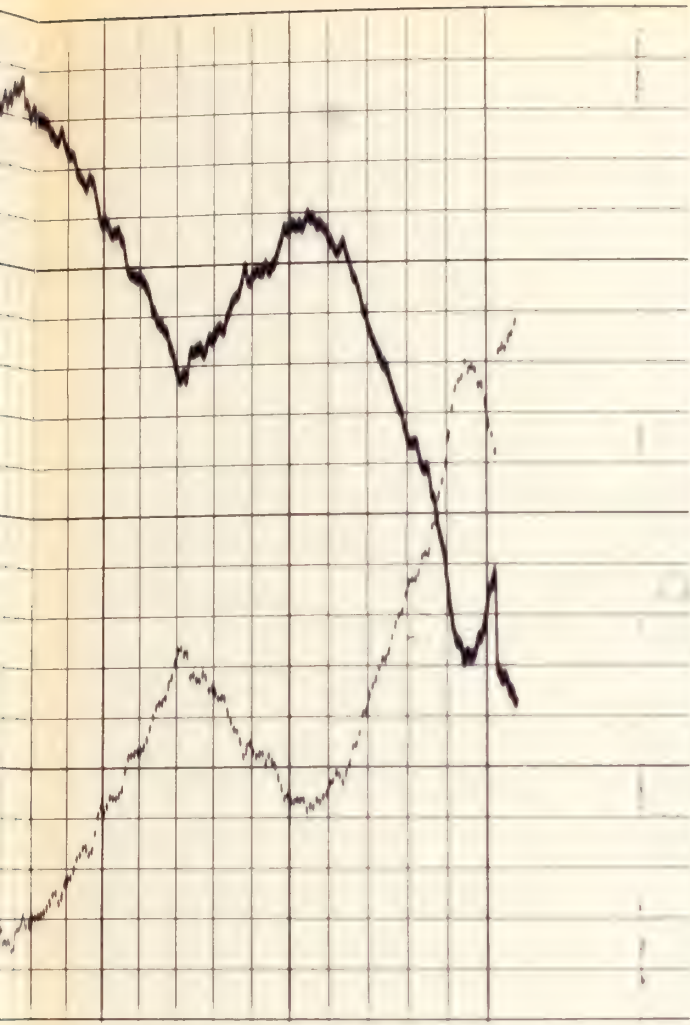
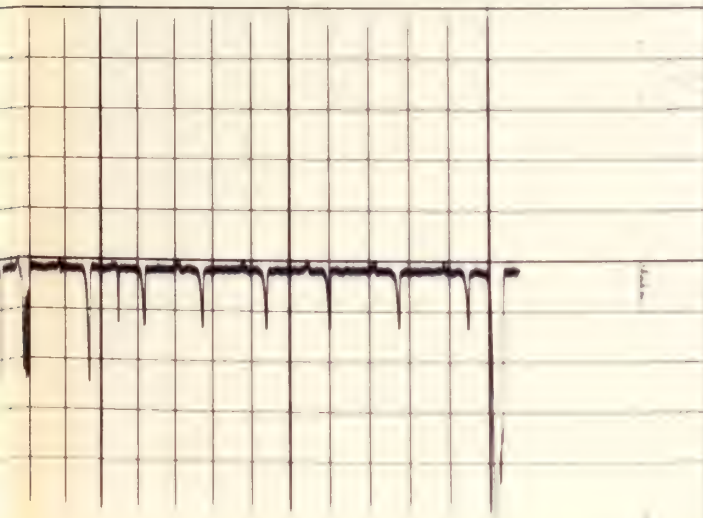
INDEXING RECORD

RADIO-ORIENTATION RECORD

NO. 3-SHORT STRING
TYPICAL ORIENTING RECORD
GUN #1-PERFORATED 1959-1149



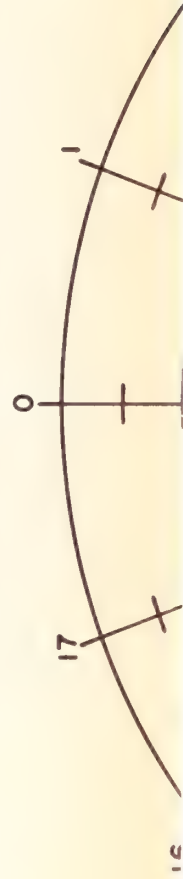


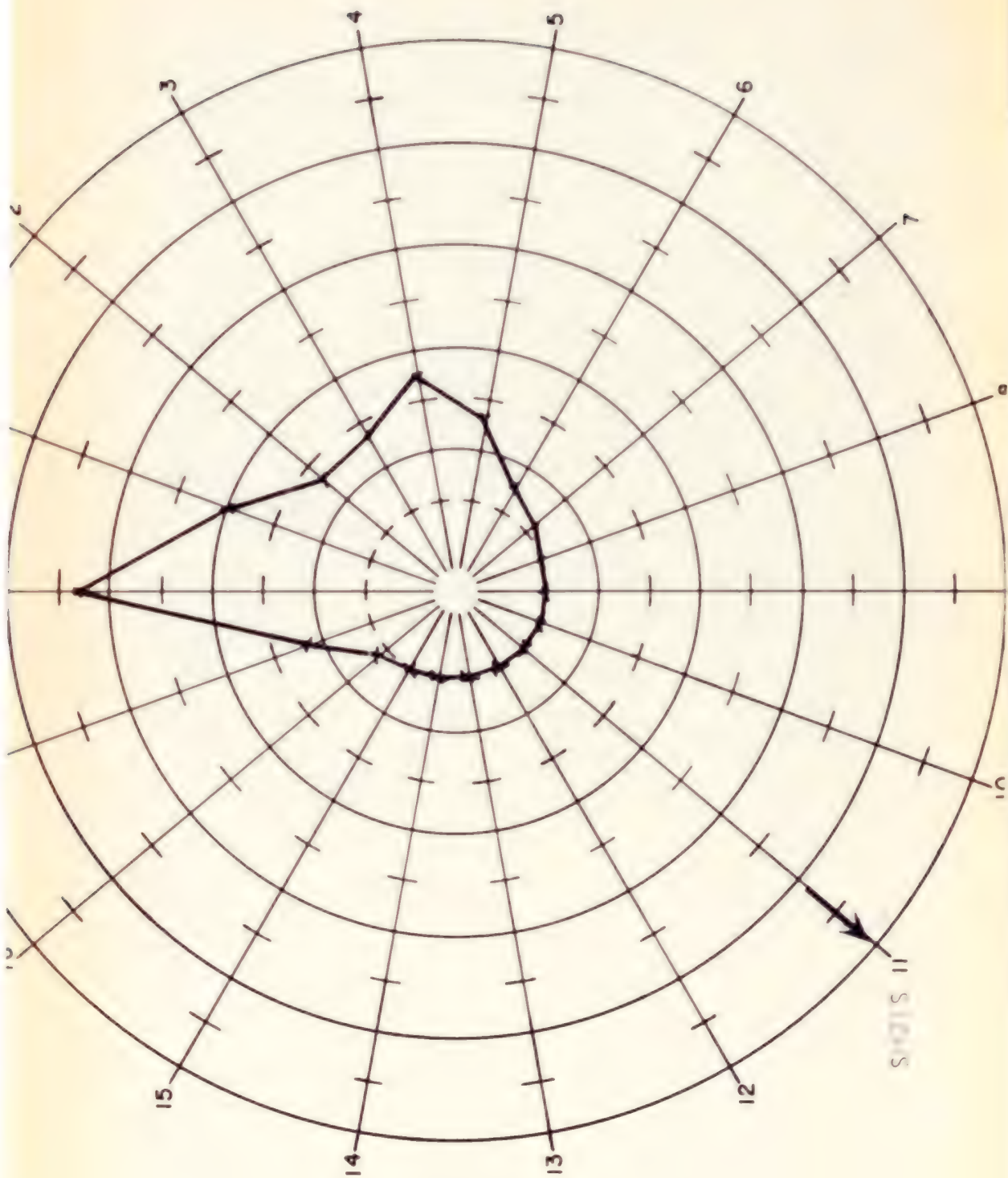


RADIO-ORIENTATION PLOT

POT-B

NO. 3-SHORT STRING PERFORMED 1330 1340 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYPER JET





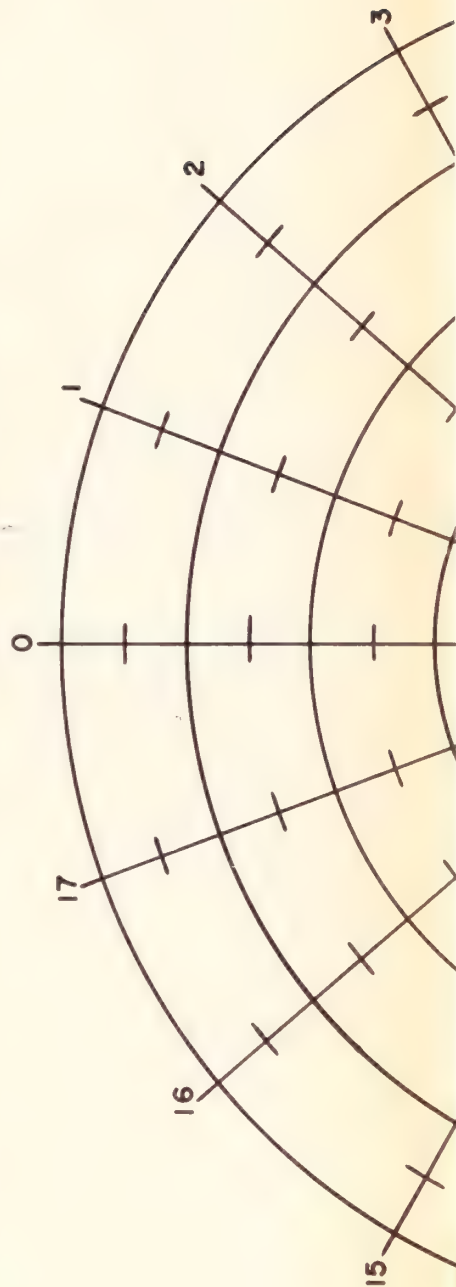
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

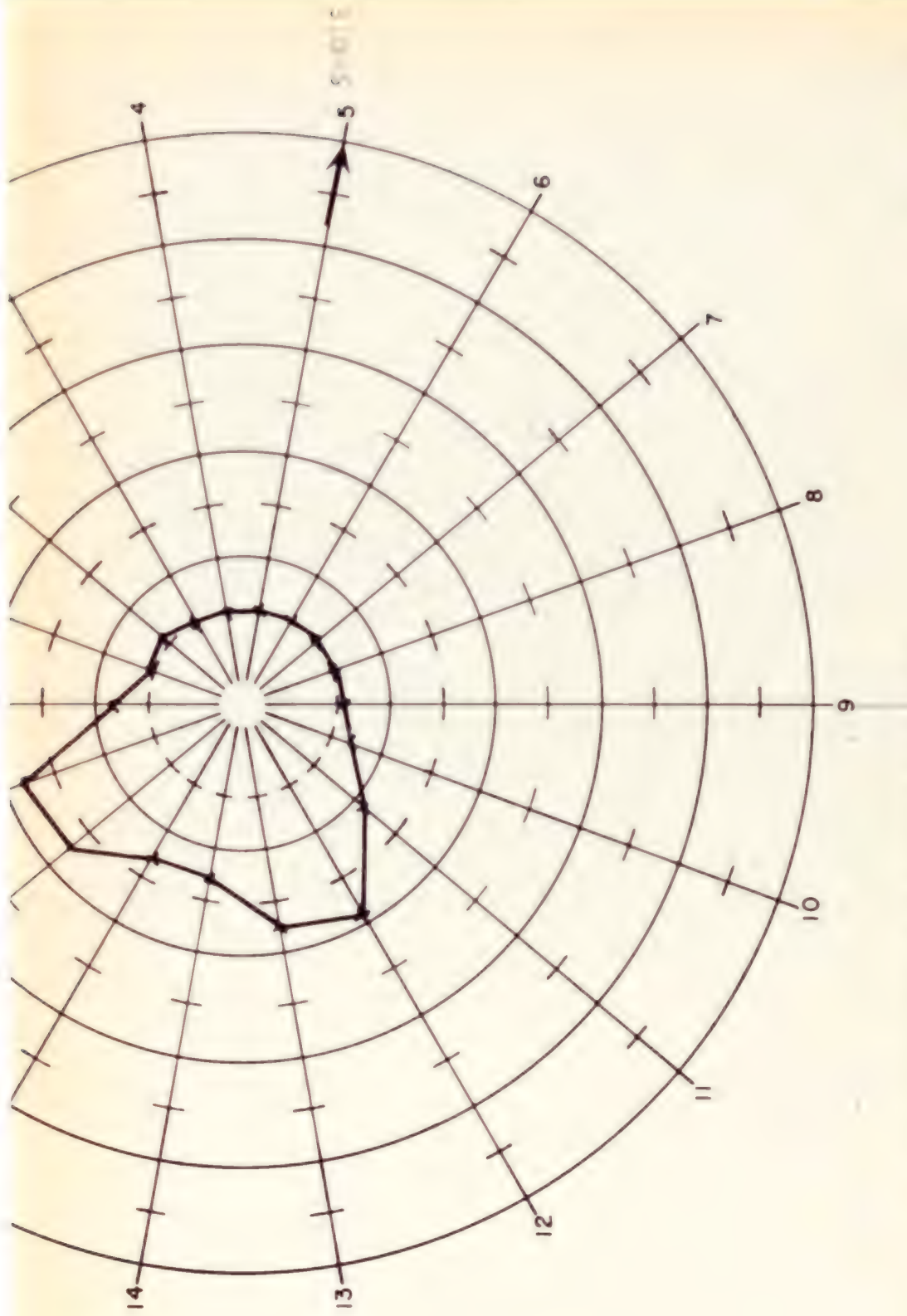
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 3 SHORT STRING PERFORATED 1319-1329 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYPER JET





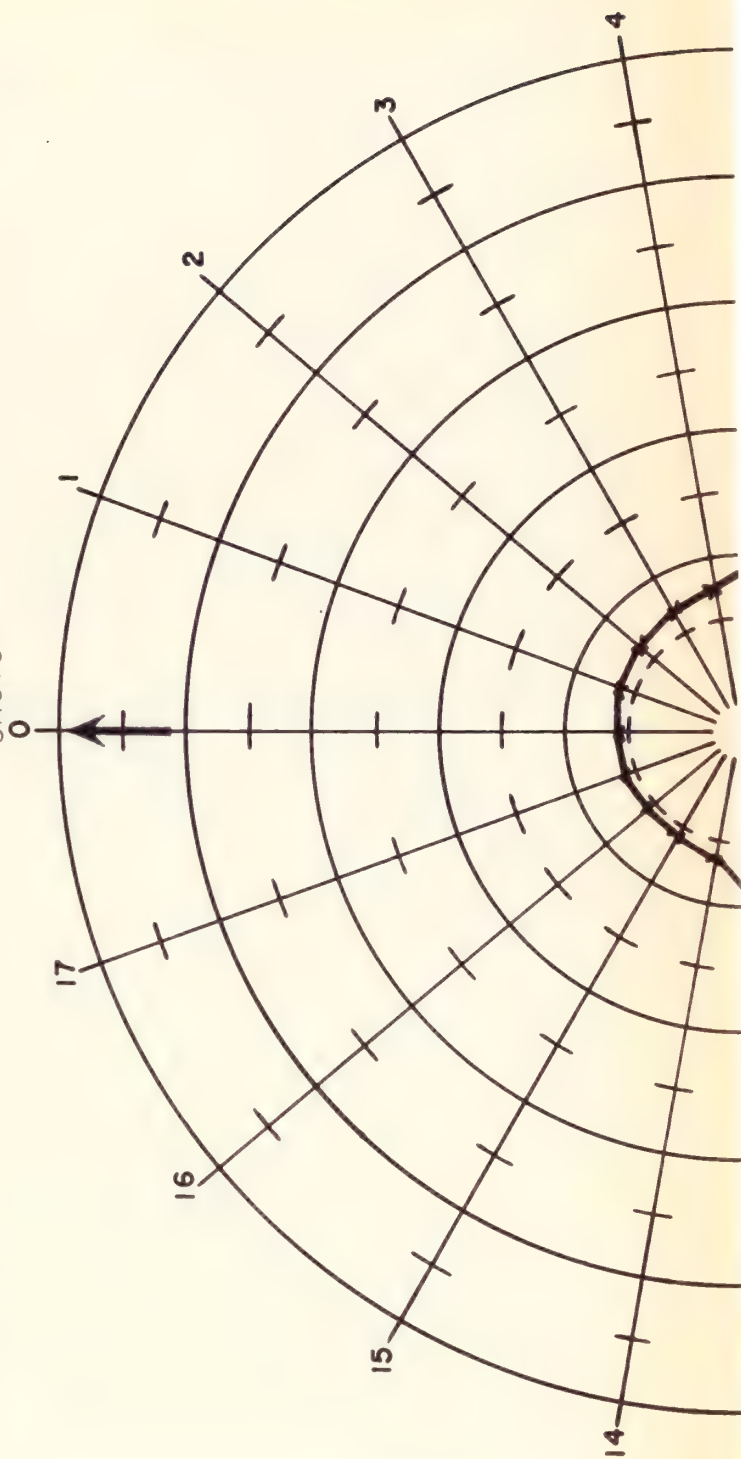
This chart, computation and/or interpretation of our readings from our gamma-gamma spectrometer and the testing instrument is presented to you in accordance with, but subject to the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which you can find on the reverse side of our Service Order for this job. The readings could be adversely affected by changes made in the drill hole and other conditions unknown to us.

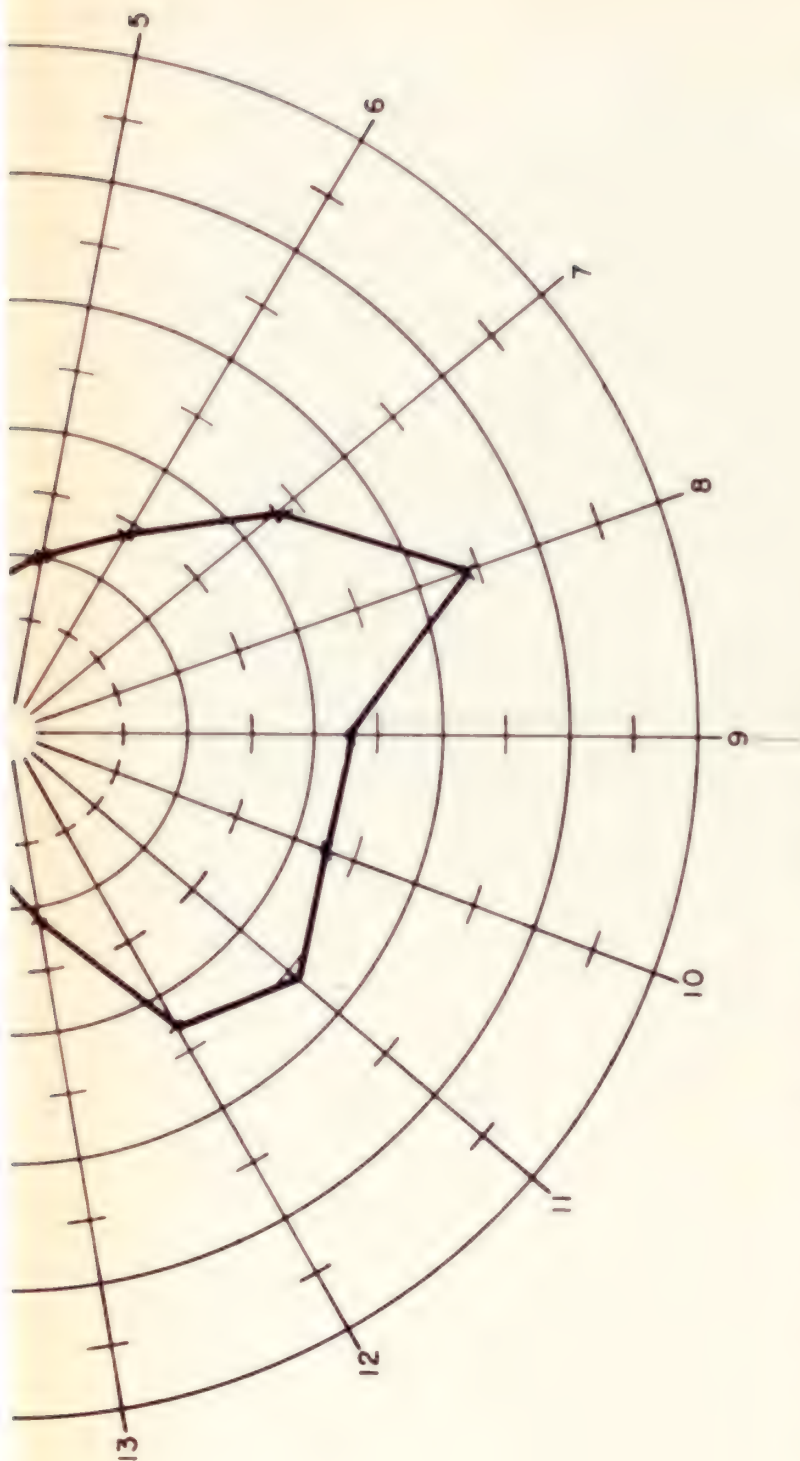
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 3 SHORT STIPIN PERFORATED 1308-1318 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYPER JET SHOTS





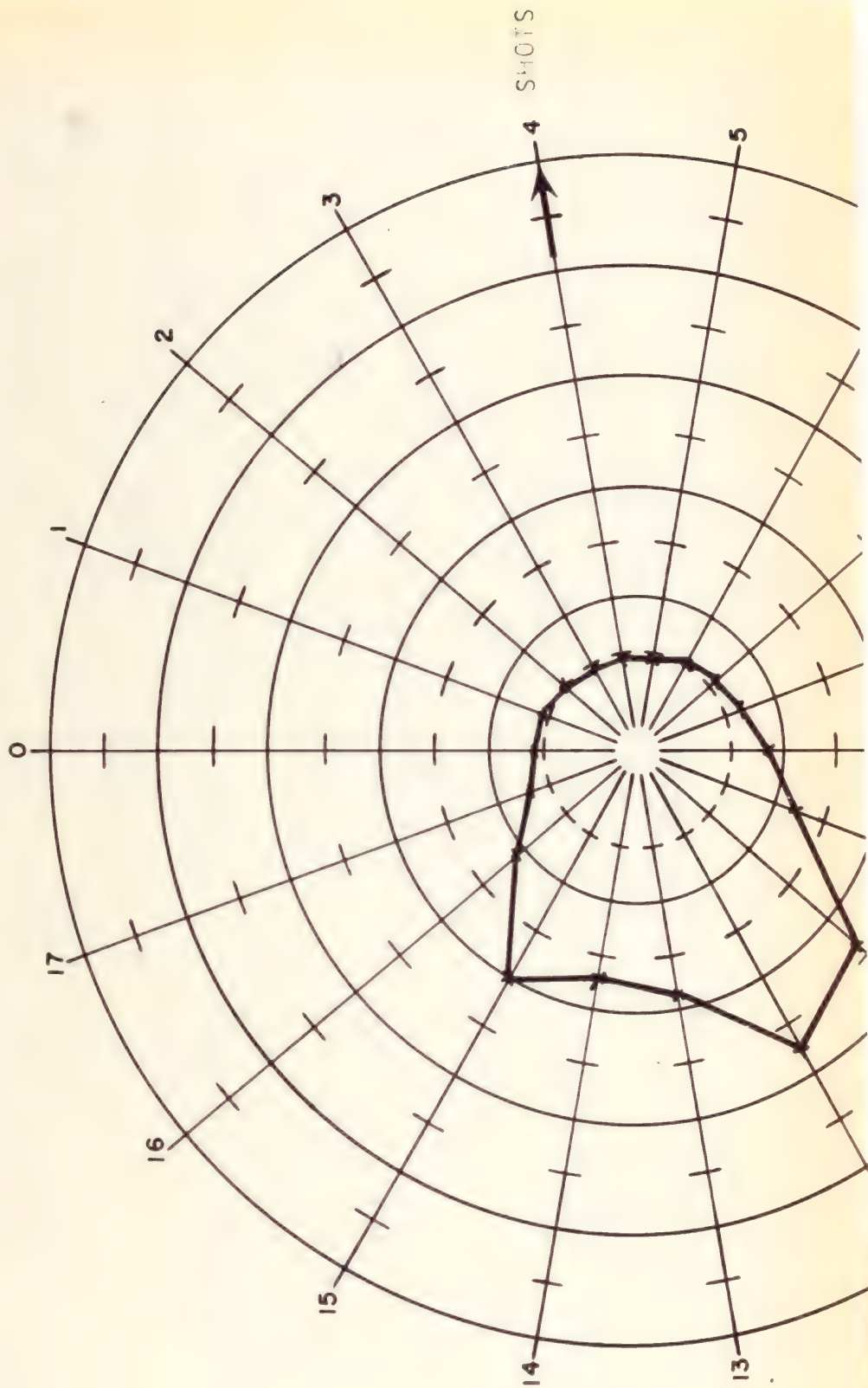
This chart, computation and/or interpretation of our readings from our games games equipment and the testing instrument is presented to you in good faith with but subject to the terms, terms and conditions as are set out on pages 1 and 2 of our current Price Schedule and which are set out and set out the reverse side of our Service Order for this job. The readings could be adversely affected by the presence of the drill hole and other conditions unknown to us.

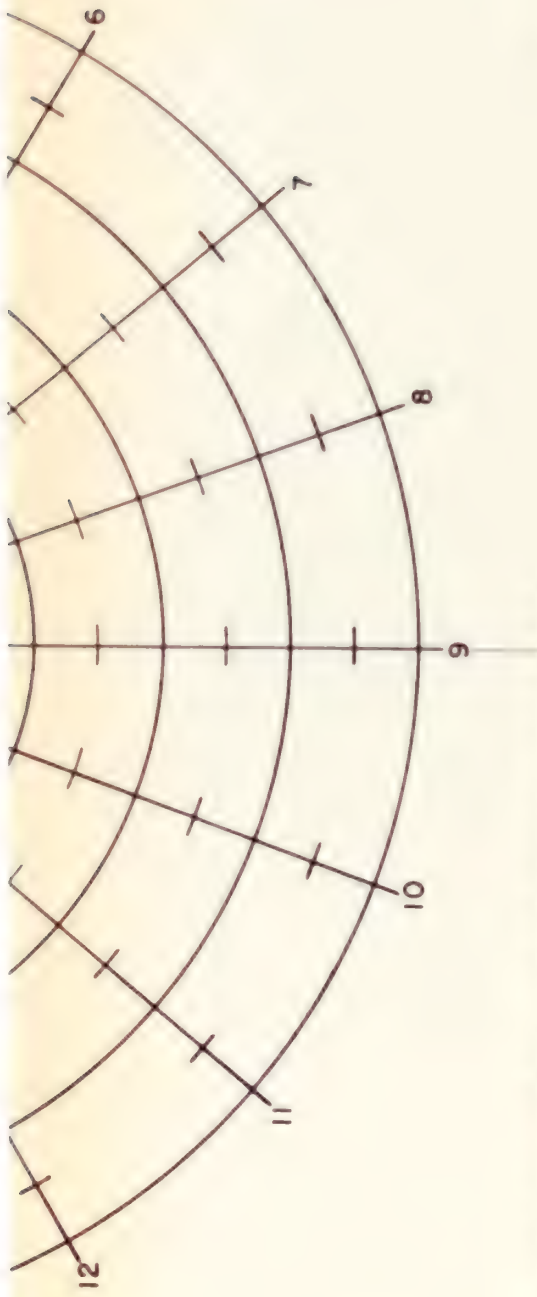
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 3 SHORT STRING PERFORATED 1297-1307 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYPER JET





This chart, computation and/or interpolation of our readings from our gamma-gamma logging tool, is presented to you in accordance with, but subject to, the General Terms and Conditions on file with our Service Order for this job. The readings could be adversely affected by irregularities in the well hole and other conditions unknown to us.

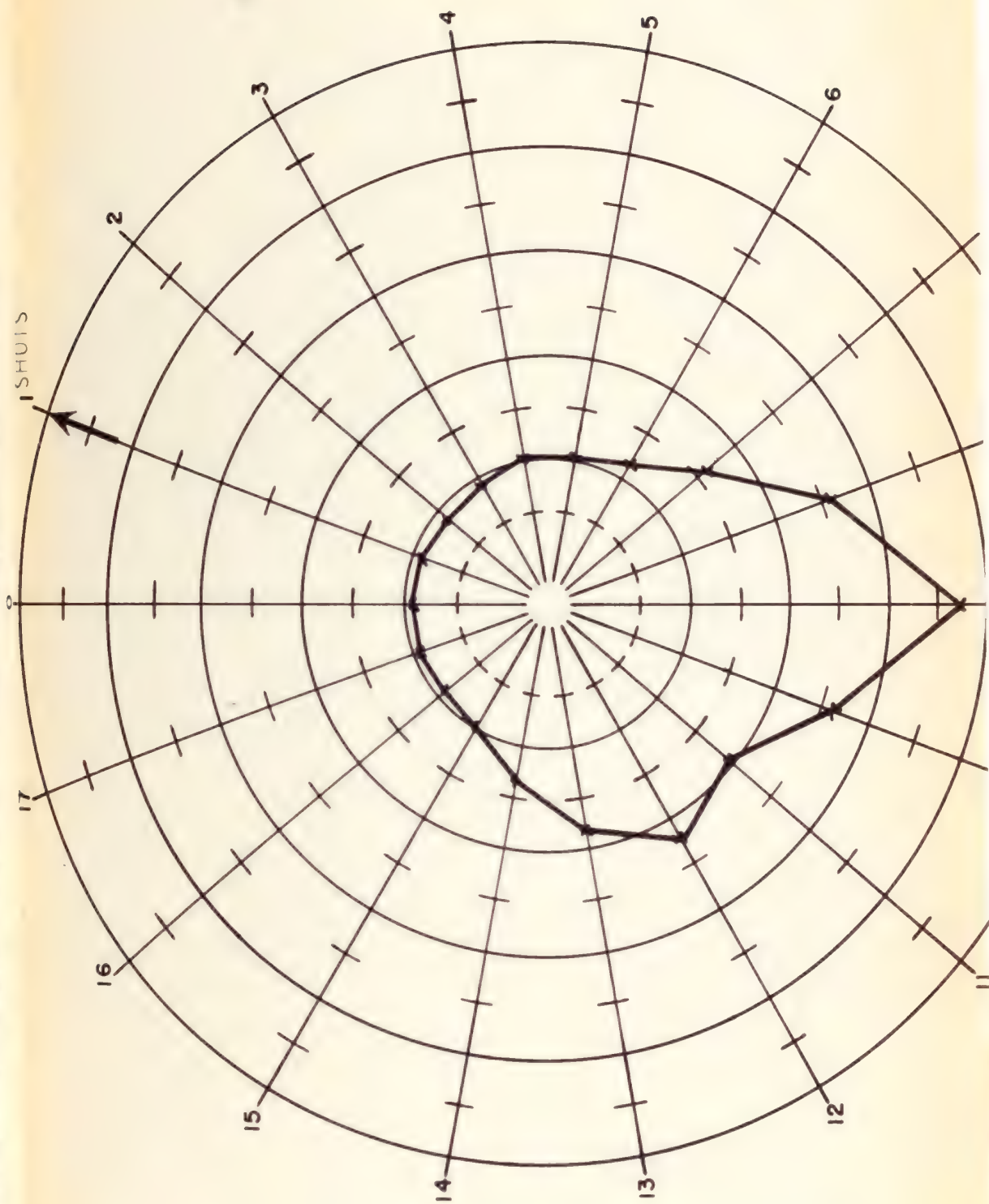
Schlumberger

RADIOORIENTATION PLOT

POT-B

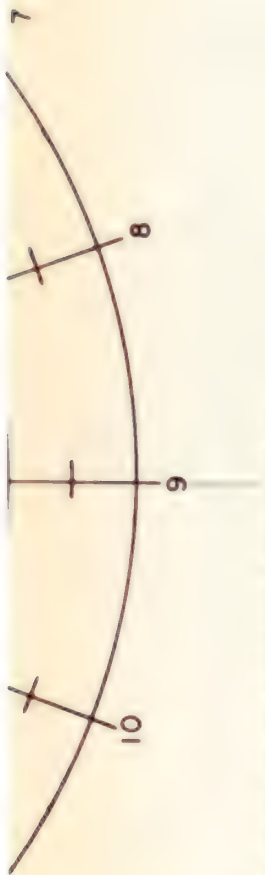
NO. 3 SHORT STRING PERFORATED 1286-1296 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYPER JET

0



Schlumberger

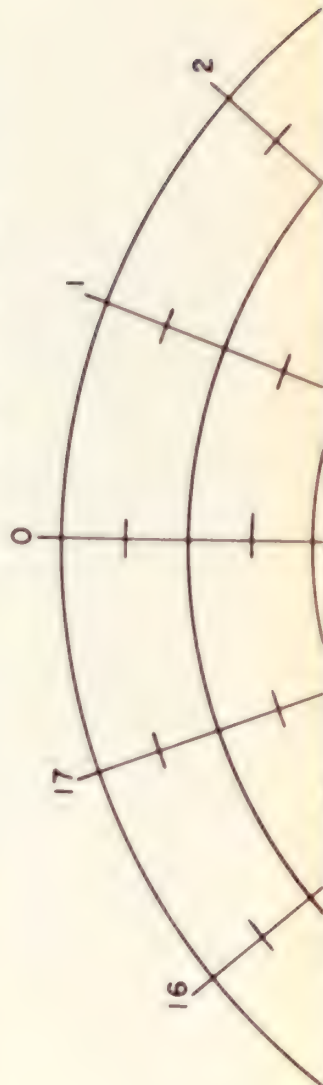
This chart, computation and/or interpretation of our readings from our gamma-gamma log-sonde used to logging instrument is presented to you in accordance with but subject to the General Terms and Conditions as are set out on pages 1 and 2 of our current Pulse Schedule and which are set out on the reverse side of our Service Order for this job. The readings could be adversely affected by unusual metal in the drill hole and other conditions unknown to us.

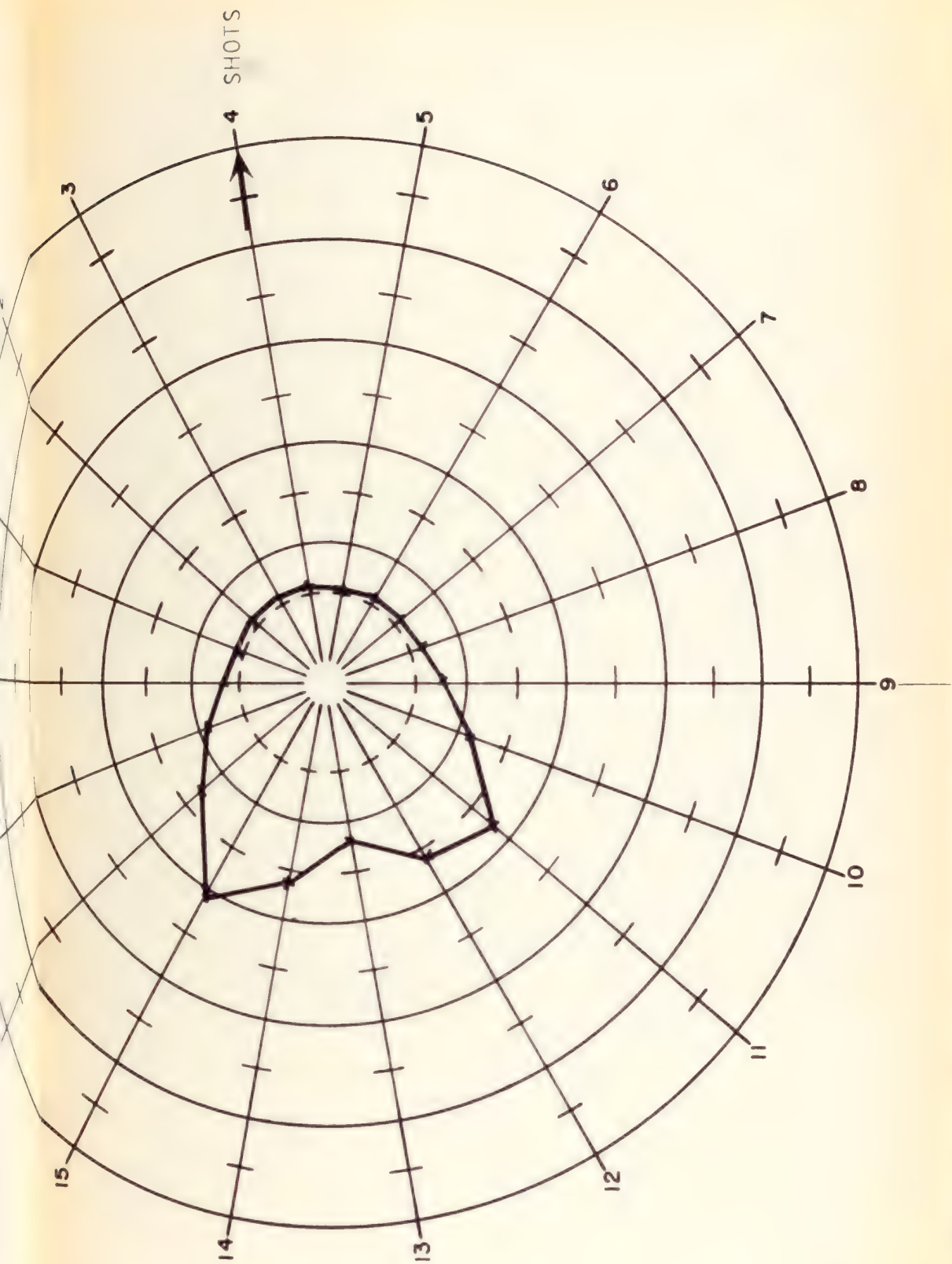


RADIO-ORIENTATION PLOT

POT-B

NO. 3 SHORT STRING PERFORATED 1275-1385 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYPER JET





This chart, computation and/or interpretation of our gamma-gamma orientation and de.

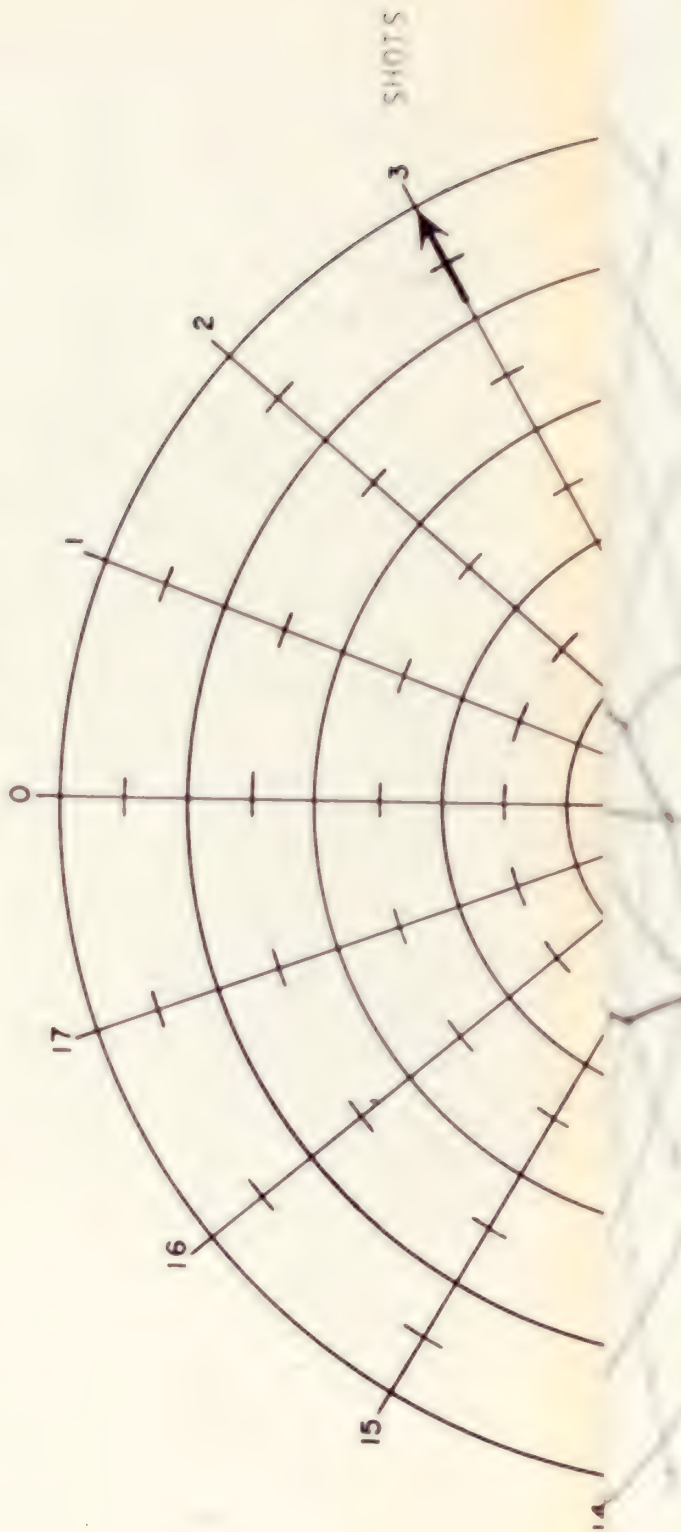
Testing instrument is presented to you in accordance with, but subject to, the General Terms and Conditions, as are set out on pages 1 and 2 of our current Price Schedule and which are at all times available for inspection at our Service Center for this job. The readings could be adversely affected by vibration, noise, or by drill hole and other conditions unknown to us.

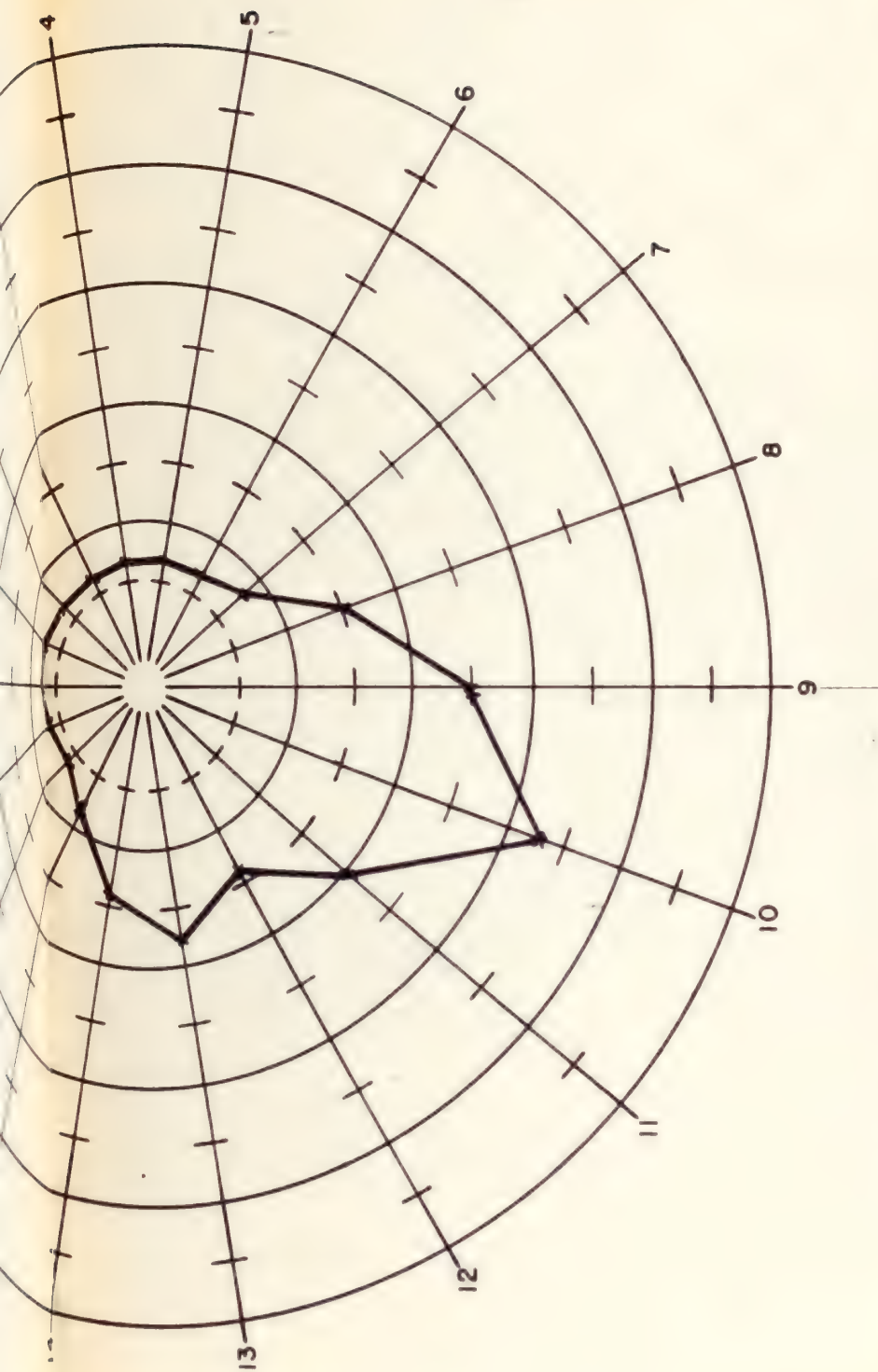
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3-SHORE SINKING PERFORMED 1264-1274 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYDRA-JET





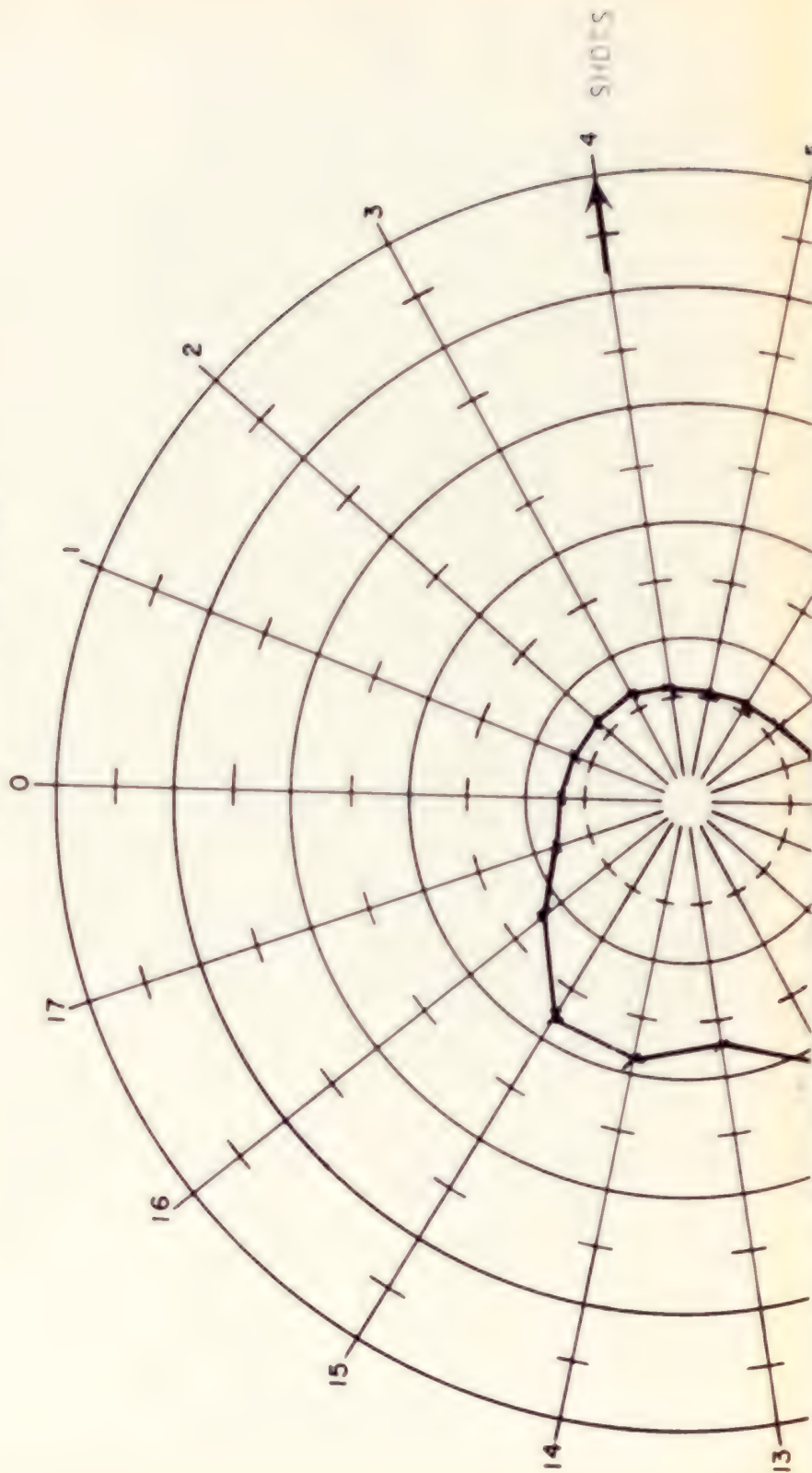
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

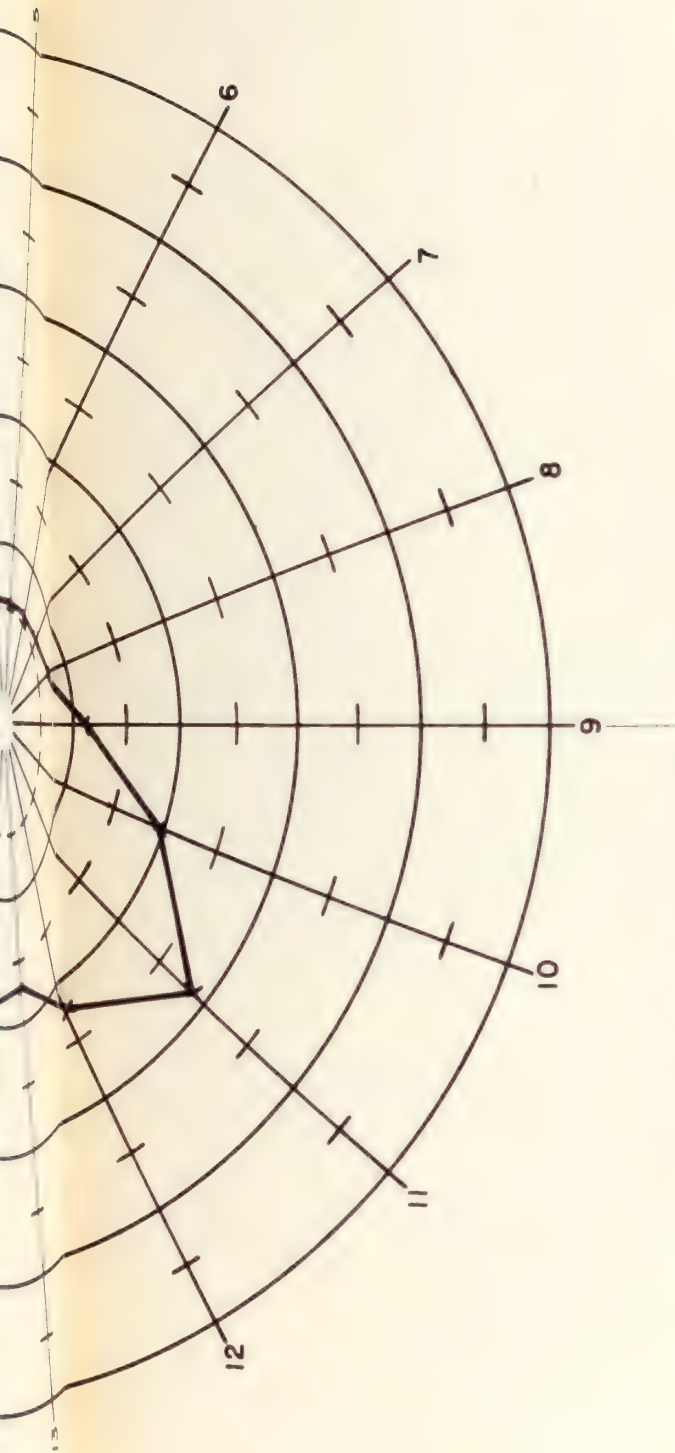
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 3-SHORT STRING, PERFORATED 1253-1261 ONE SHOT PER FOOT WITH 1 9/16" SCALLOPED HYPER JET





chart, computation and/or interpretation of our readings from our gamma-gamma orientation and determining instrument is presented to you in accordance with, but subject to, the General Terms and Conditions are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse of our Service Order for this job. The readings could be adversely affected by vagrant metal in the hole and other conditions unknown to us.

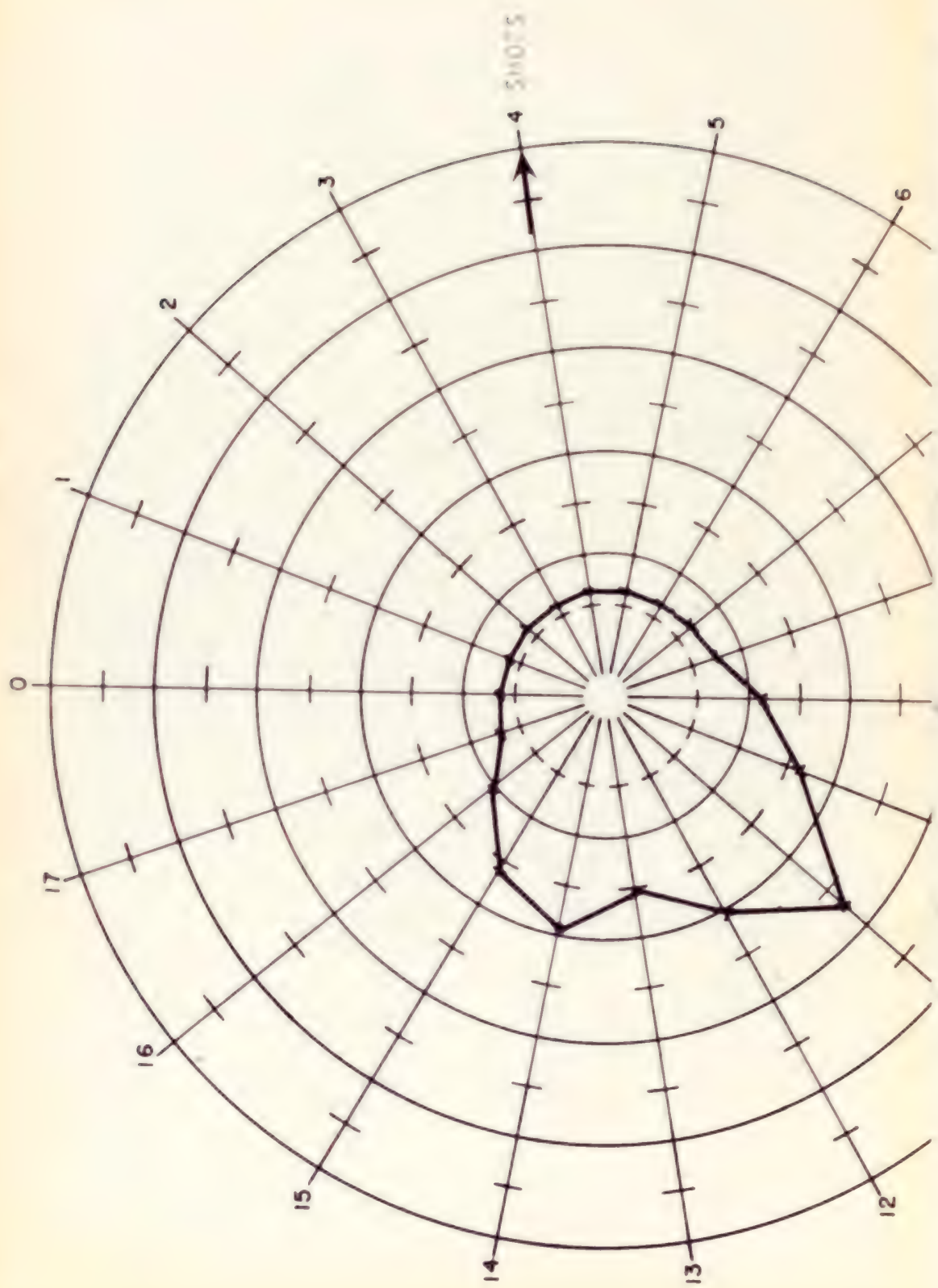
Schlumberger

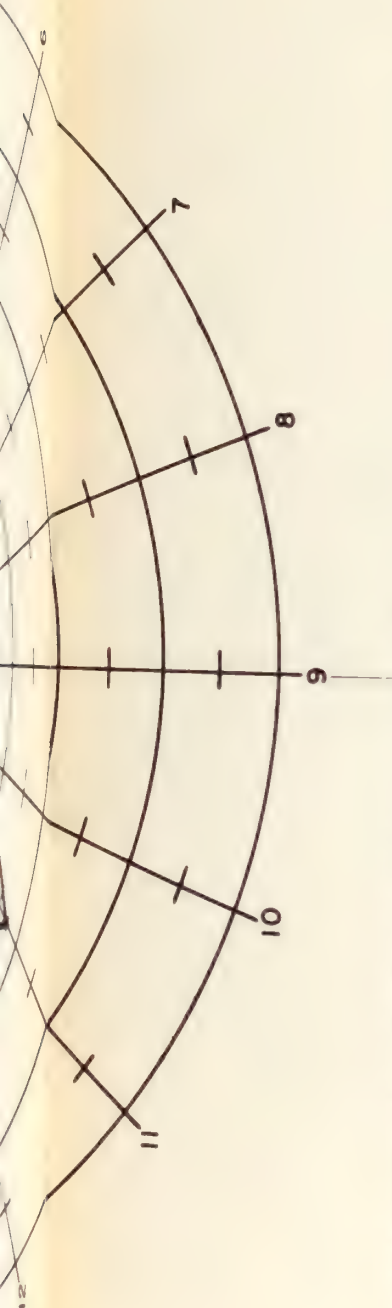
RADIOORIENTATION PLOT

POT-B

500' PER FOOT 10' 10' 10'

CLIMATOLOGICAL DATA



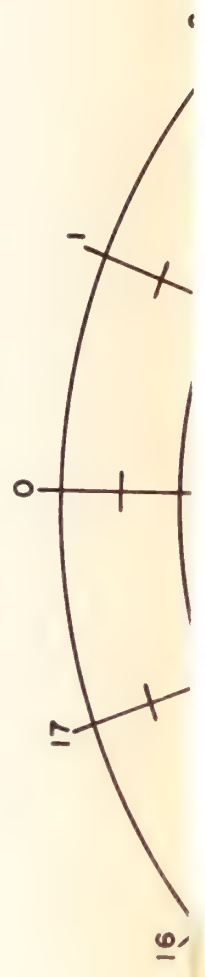


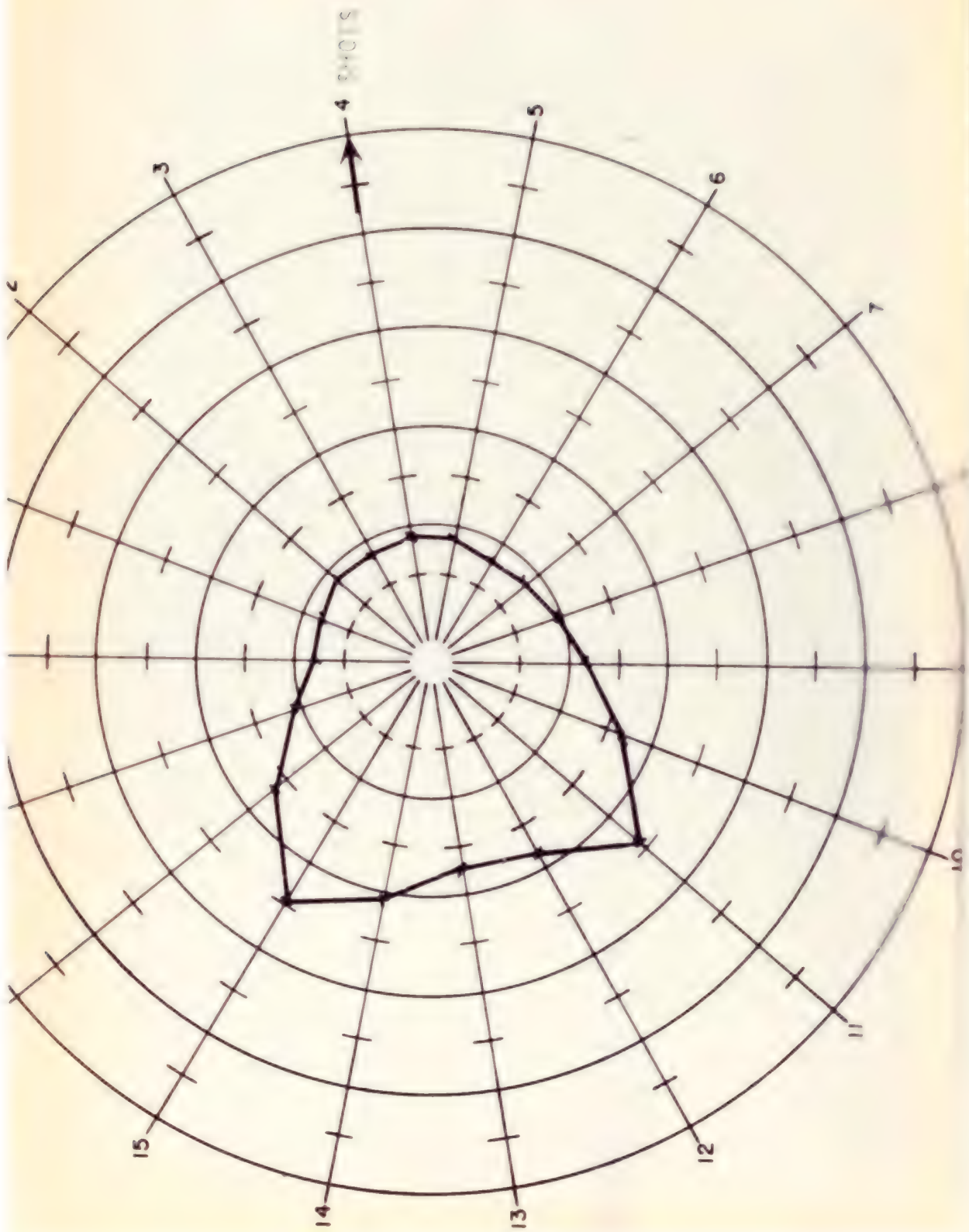
art, computation and or interpretation of our readings from our gamma gamma orientation and the instrument is presented to you in accordance with, but subject to, the General Terms and Conditions set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse of our Service Order for this job. The readings could be adversely affected by vagrant metal in the hole and other conditions unknown to us.



RADIOORIENTATION PLOT POT-B

3-SHORT STRING PERFORATED 1242-1248 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





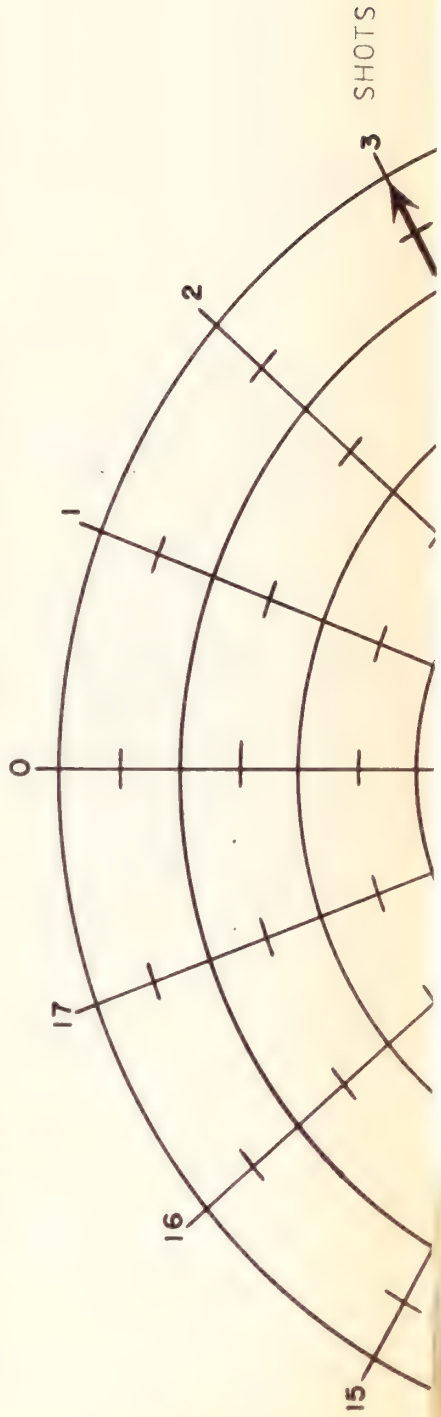
computation and/or interpretation of the data is the responsibility of the user. Schlumberger is not responsible for any errors or omissions in the data or for any damage to property or persons resulting from the use of the data. Schlumberger is not responsible for any damage to property or persons resulting from the use of the data. Schlumberger is not responsible for any damage to property or persons resulting from the use of the data.

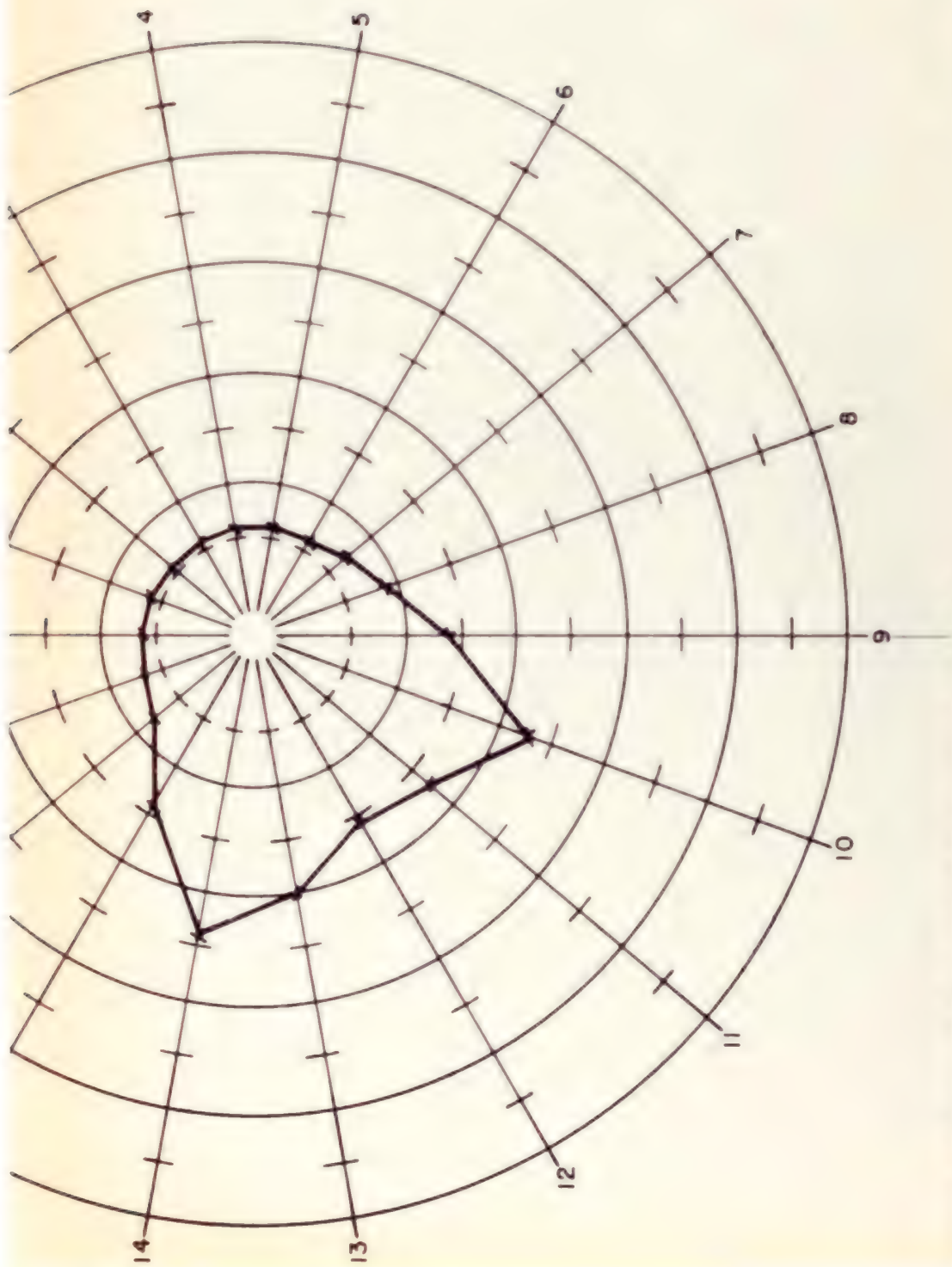
Schlumberger

RADIOORIENTATION PLOT

POT-B

SHORT STRING PERFORATED 1238-1248 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

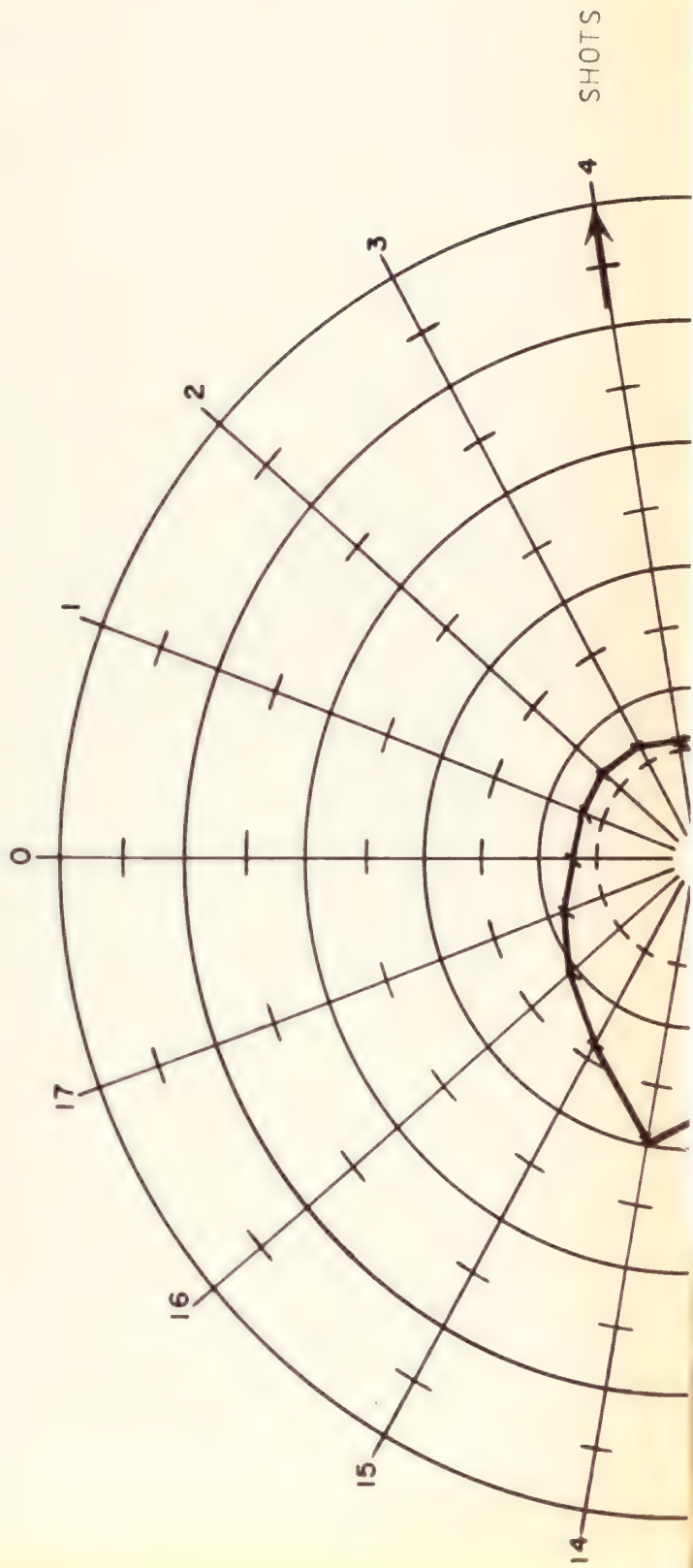


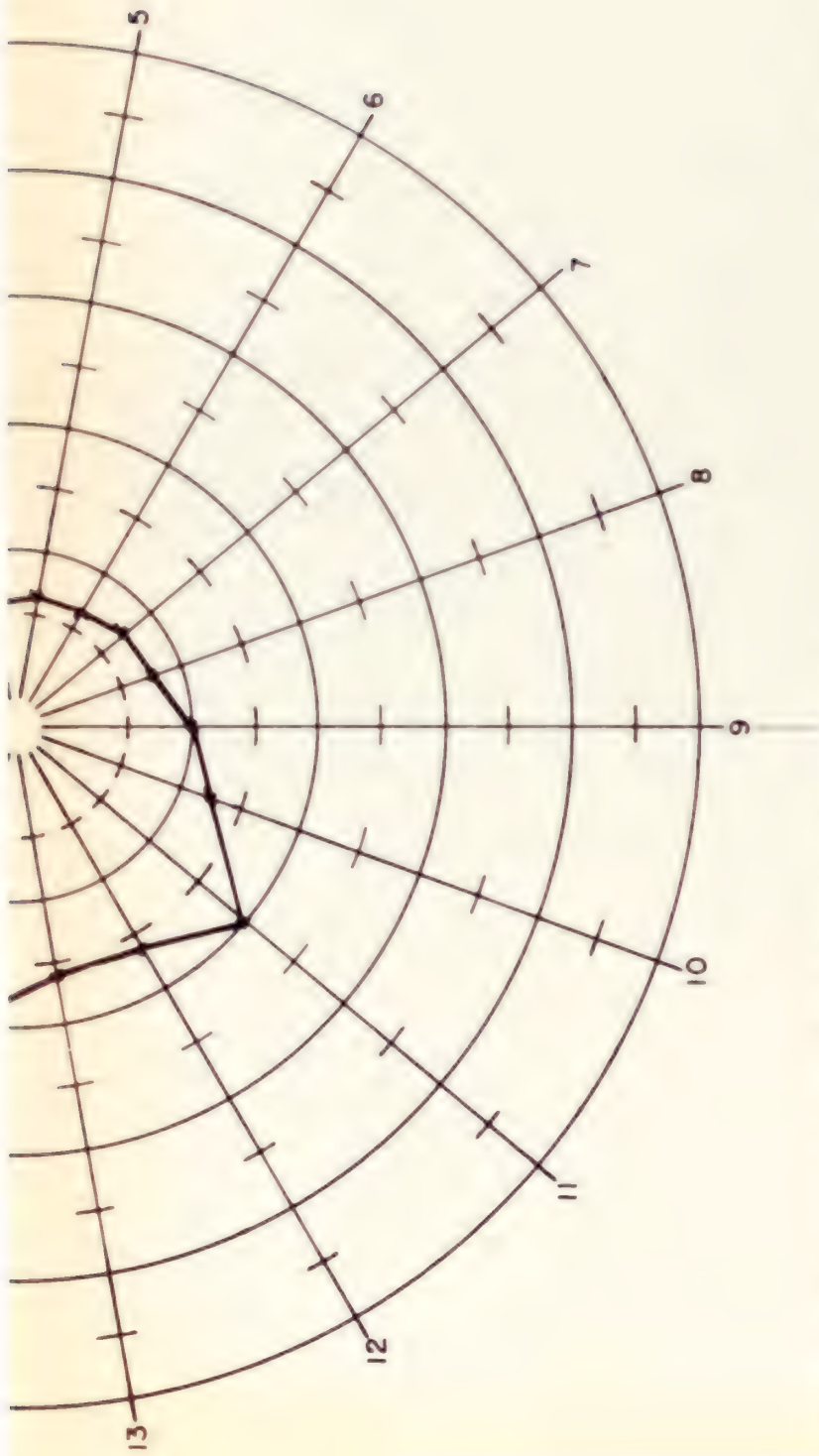


computer and for interpretation of our readings from our gamma-gamma stations and do
 not need to be as accurate as the other stations. The gamma-gamma stations and functions
 are plotted on the log-log scale and will not be as accurate as the other stations.
 The gamma-gamma stations and will not be as accurate as the other stations.
 The gamma-gamma stations and will not be as accurate as the other stations.

RADIOORIENTATION PLOT

POT-B
SHORT STRING PERFORATED 1227-1237 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



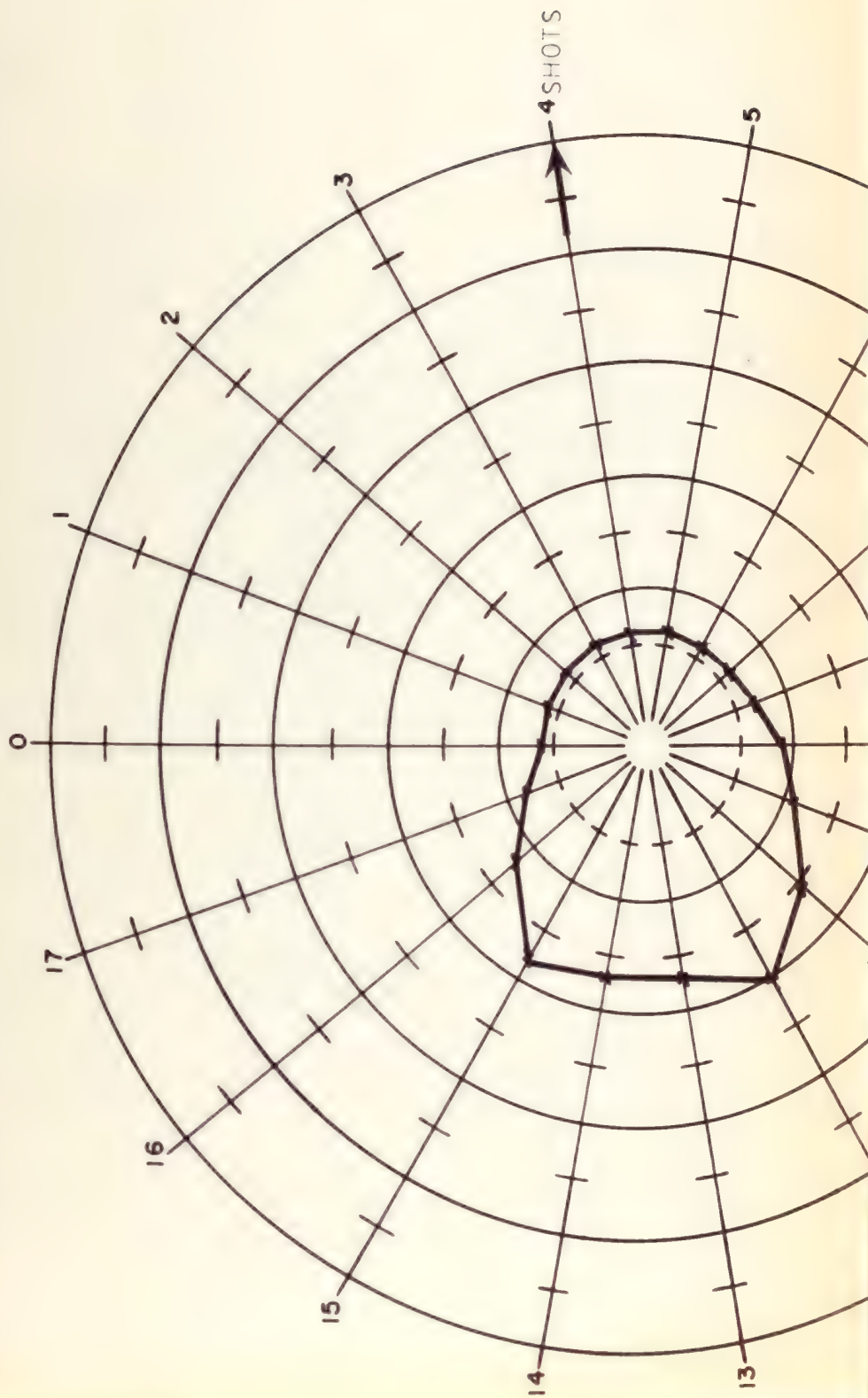


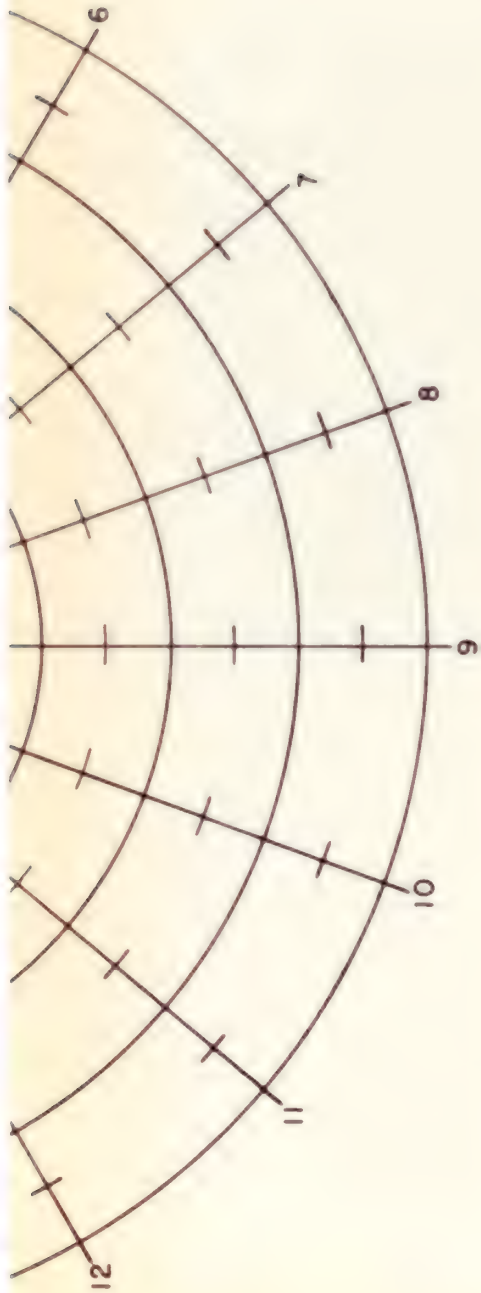
computation and/or interpretation of our readings from our gamma-gamma instrument is presented to you in accordance with, but subject to, the General Terms and Conditions set out on pages 1 and 2 of our current Price Schedule and which are set out at the end of this Service Order for this job. The readings could be adversely affected by unknown events in the and other conditions unknown to us.

RADIO-ORIENTATION PLOT

POT-B

SHORT STRING PERFORATED 1216-1226 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





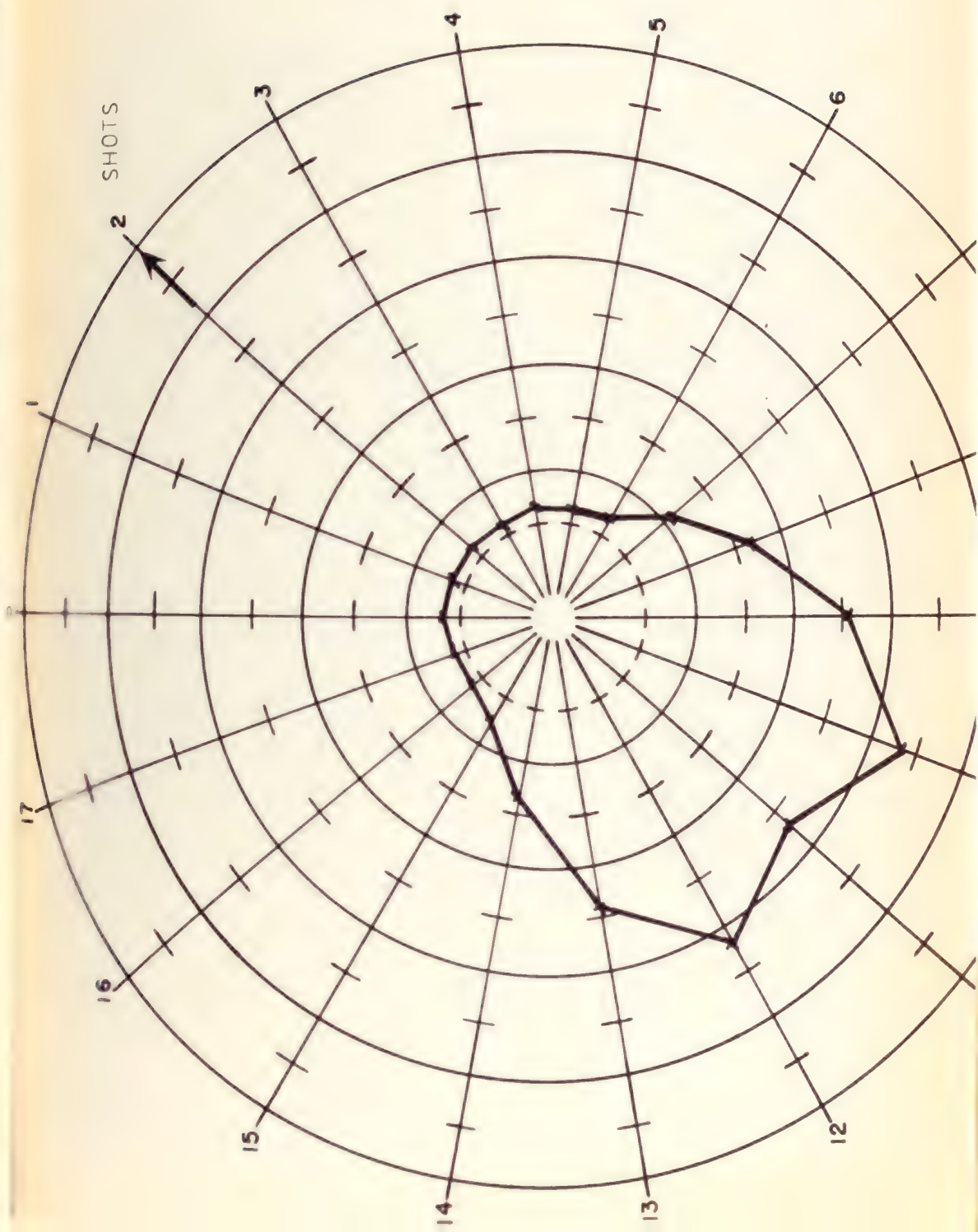
computation and/or interpretation of our readings from our gamma-ray meter. The data is
 presented to you in accordance with the format of the Standard Form and Guidelines
 out on pages 1 and 2 of our current Policy Schedule and which are set out in the
 Service Order for this job. The readings could be adversely affected by changes in the
 and other conditions unknown to us.

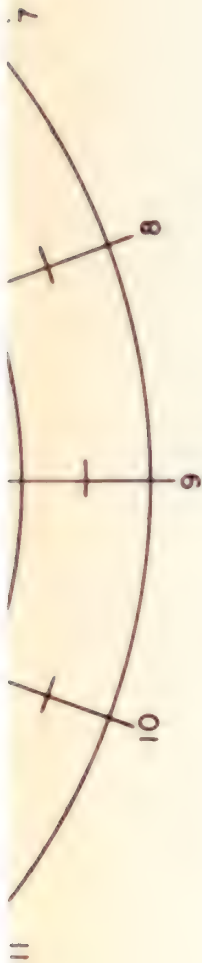
Schlumberger

RADIO-ORIENTATION PLOT

POT-8

11/1/18 HALL ROOM





computation and/or interpretation of our readings from our geophysical systems. The data presented to you in this document is presented to you in confidence with the understanding that the data is not to be used for any other purpose than the one for which it was provided. The data is not to be used for any other purpose than the one for which it was provided. The data is not to be used for any other purpose than the one for which it was provided.

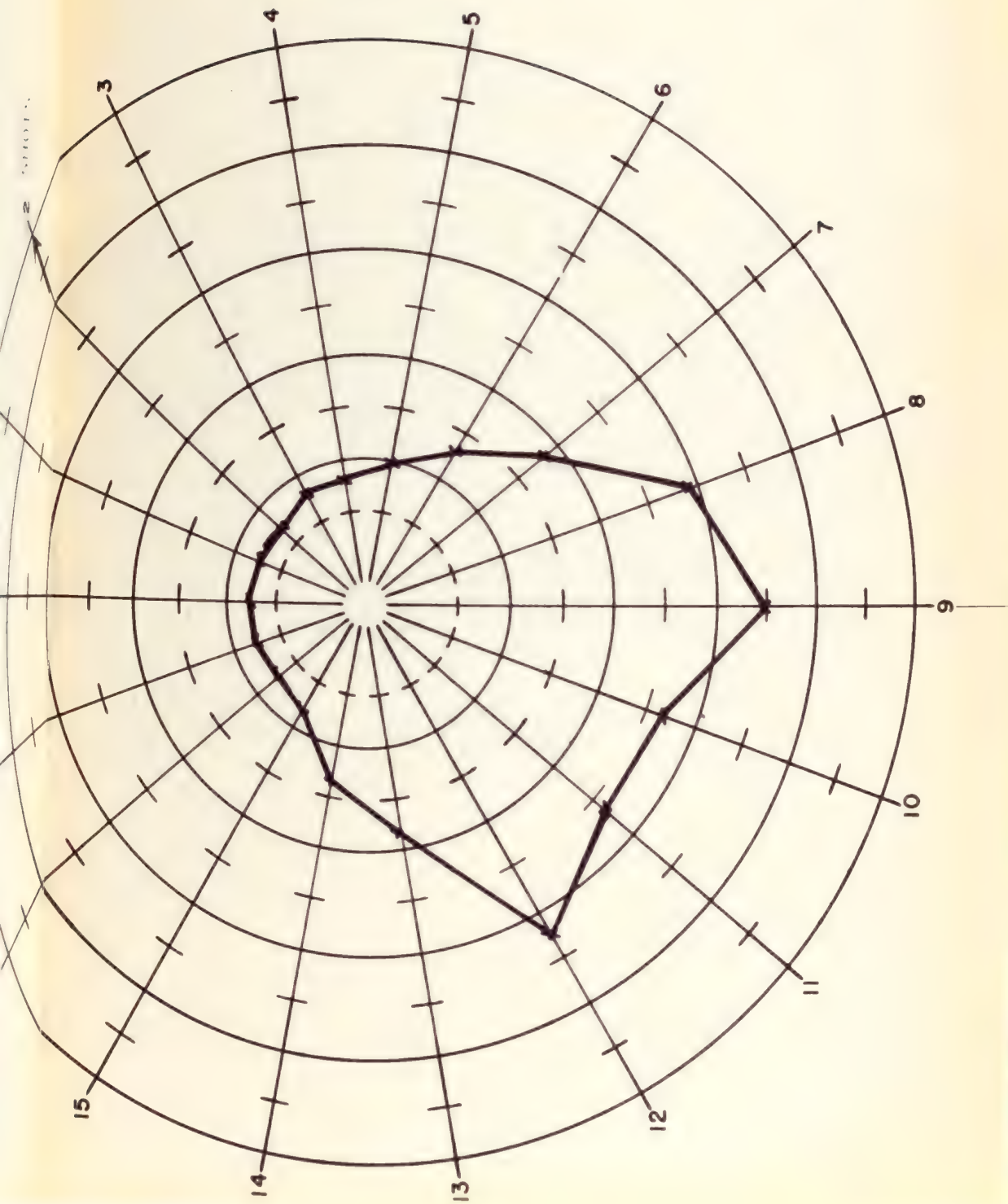
Schlumberger

RADIOORIENTATION PLOT

POT-B

3-SHORT STRING PERFORATED 1194-1204 ONE SHOT PER FOOT WITH 1 11/16" HIFESODME



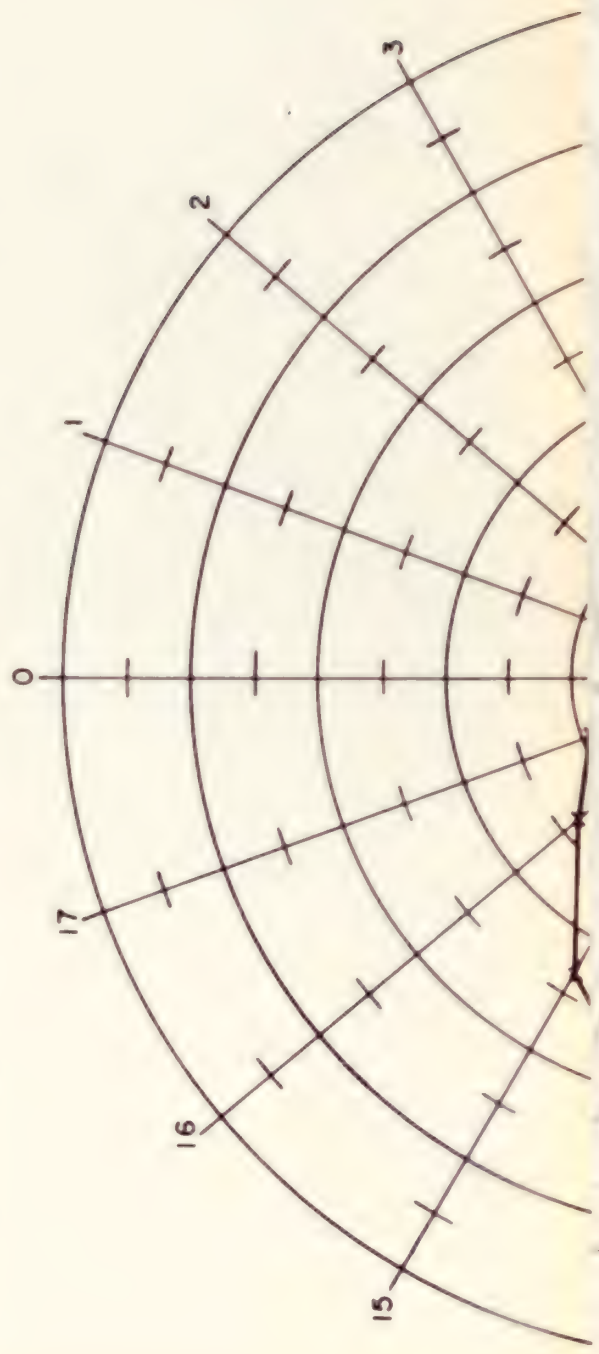


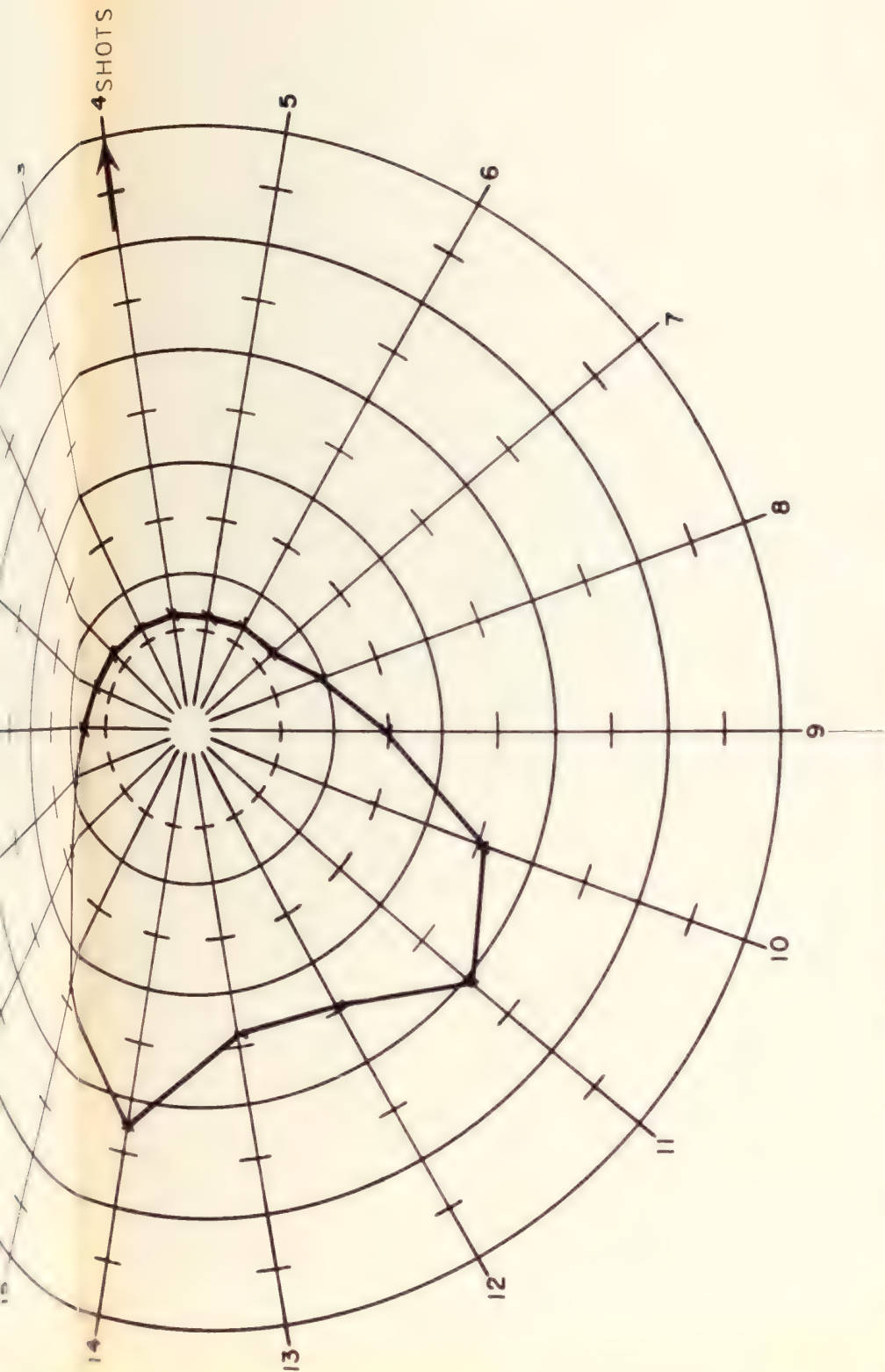
not, computation and/or interpretation of our readings from our gamma-gamma logging tool and/or
 instrument is presented to you in accordance with our license to the Bureau of Land Management
 and not for purposes 1 and 2 of our license from the Bureau of Land Management and we do not warrant the accuracy
 of our gamma-gamma tool or the tool's readings. The readings shall be subject to adjustment made by the
 geologist and other geologists unknown to us.

RADIOORIENTATION PLOT

POT-B

3 SHOT SIRING PERFORATED 1103-1193 ONE SHOT PER FOOT WITH 1 11/16" HOLE



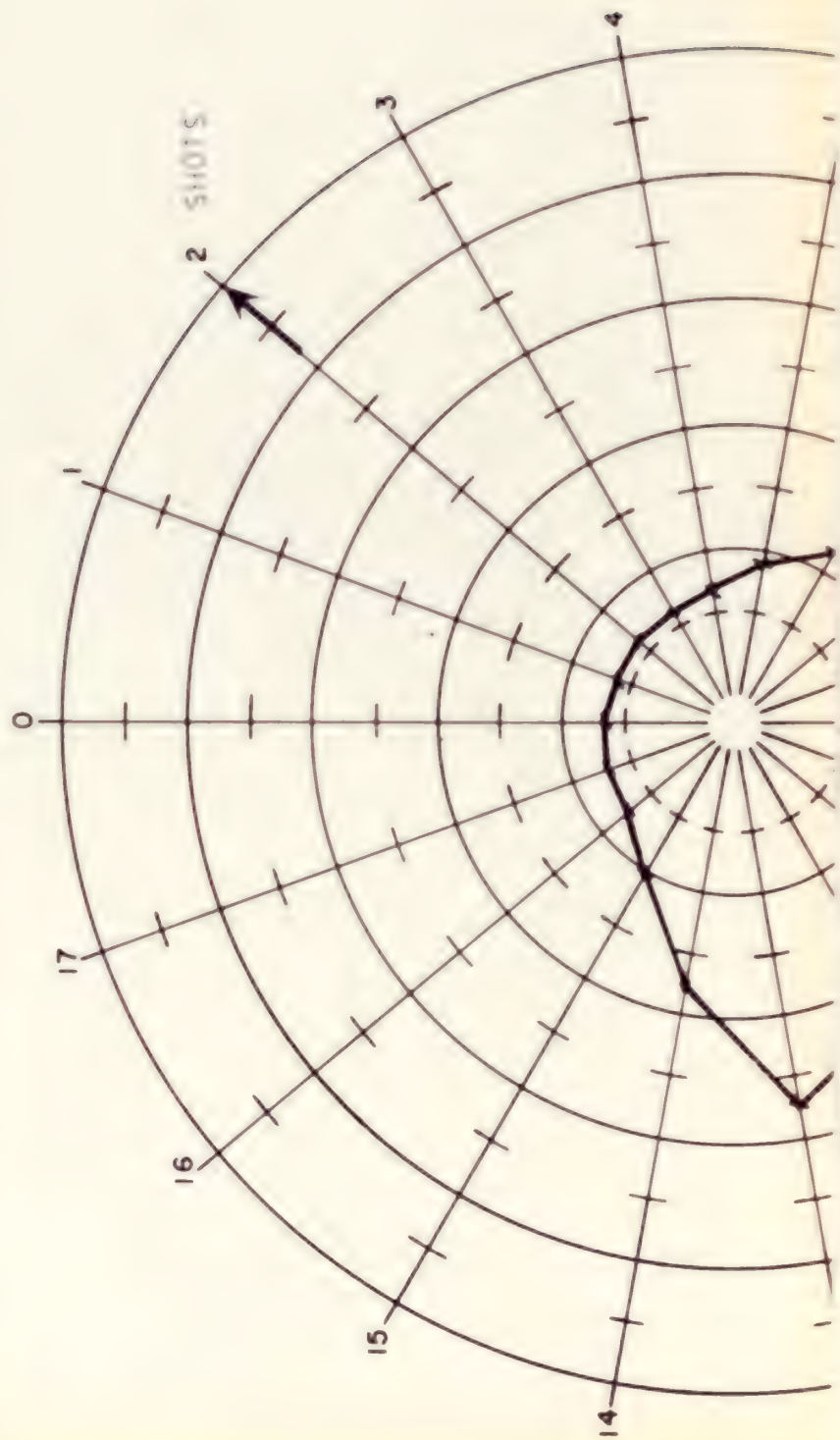


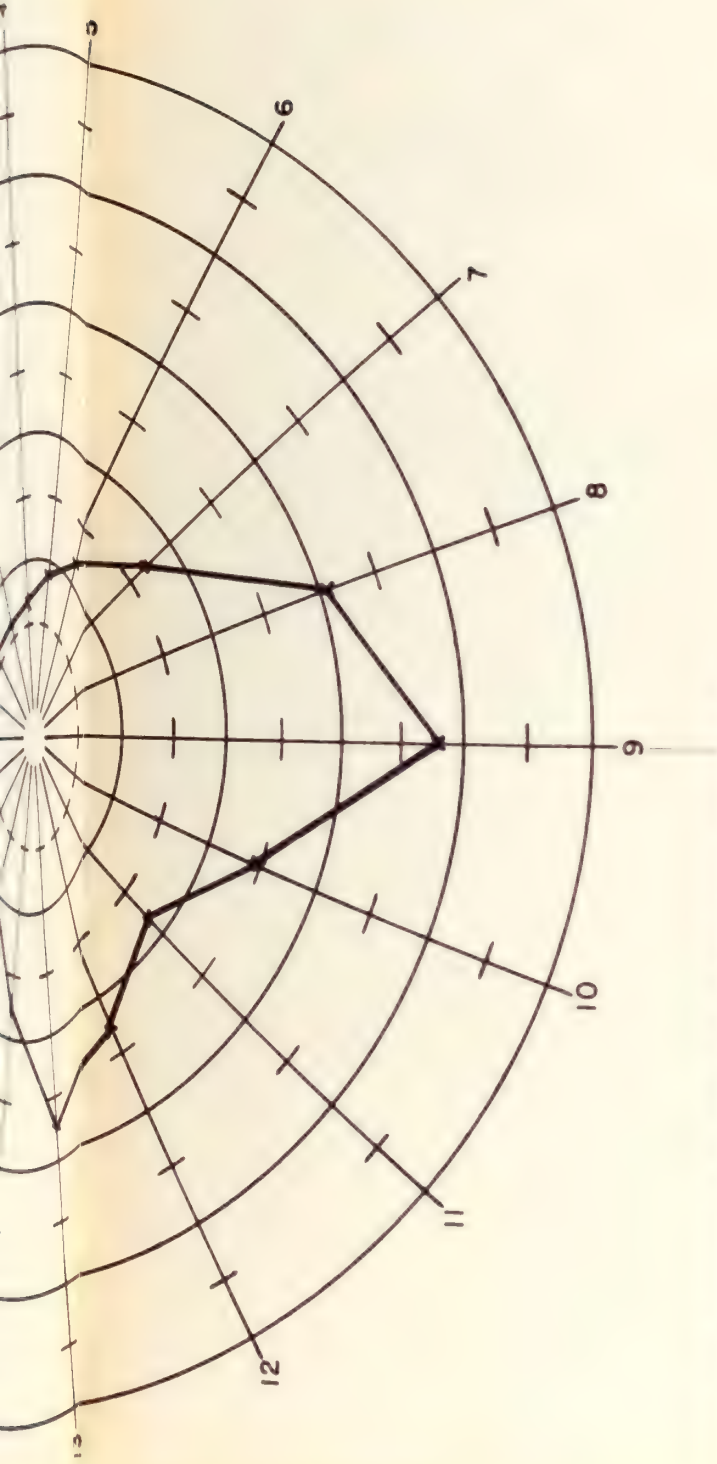
ort, computation and/or interpretation of our readings from our gamma-gamma orientation and de
 instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
 set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
 our Service Order for this job. The readings could be adversely affected by vagrant metal in the
 and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

1.3 SHORT STRIP PERFORATED 1172-1182 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

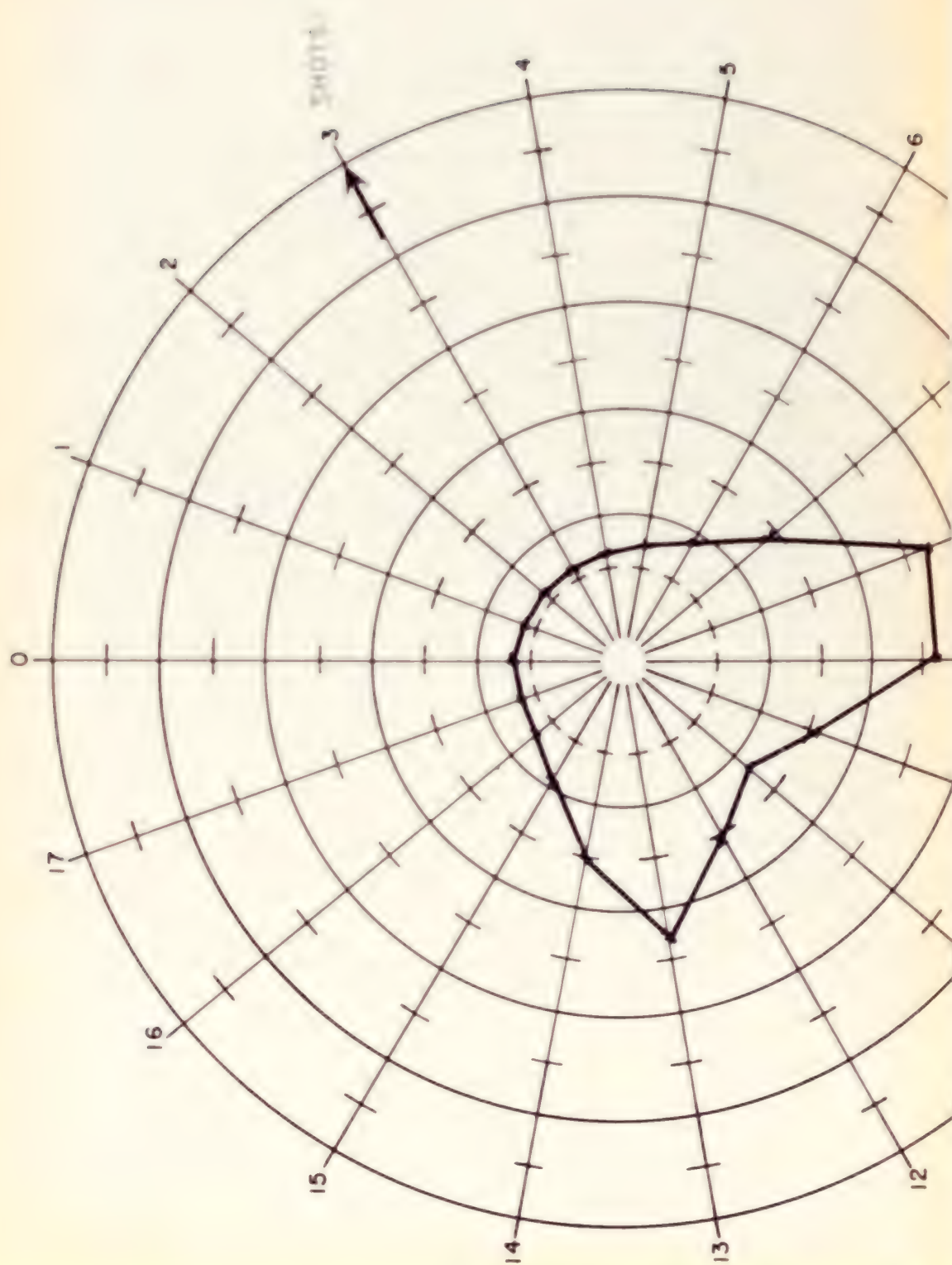


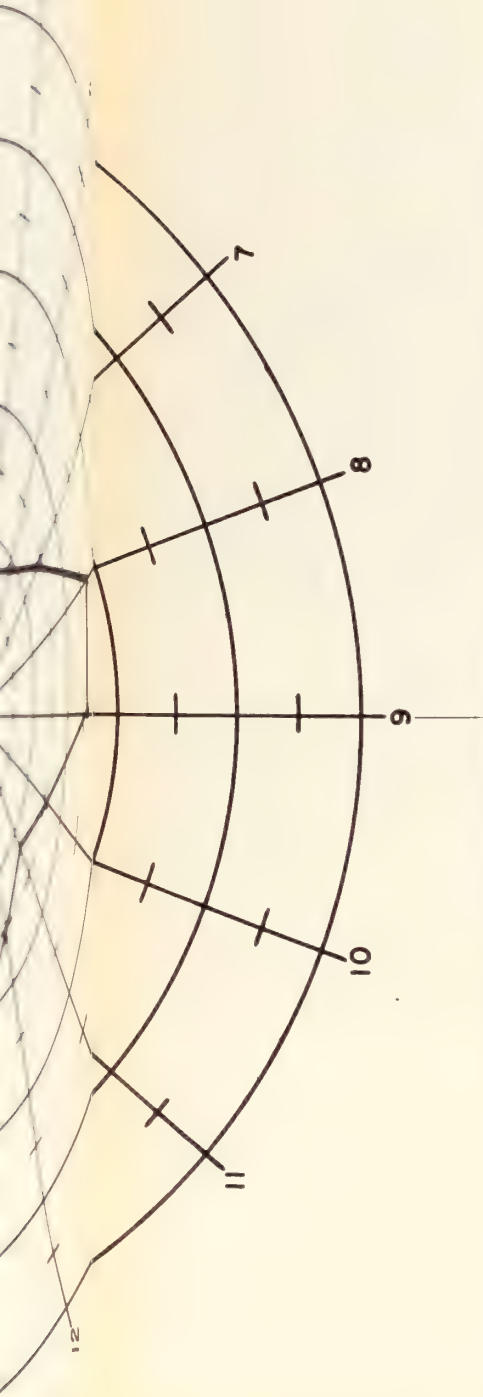


opt. computation and/or interpretation of our readings from our gamma gamma orientation and de
 instrument is presented to you in accordance with, but subject to the General Terms and Conditions
 set out on pages 1 and 2 of our current Price Schedule and which are set out on the reverse
 of our Service Order for this job. The readings could be adversely affected by variant metal in the
 ore and other conditions unknown to us.

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RADIOORIENTATION PLOT POT-B





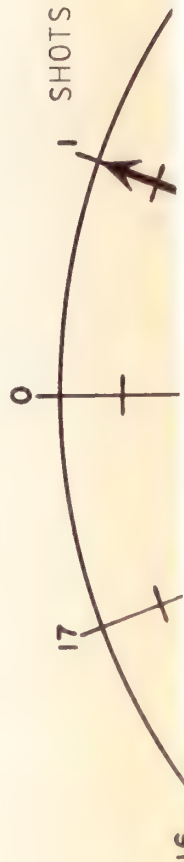
12
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Schlumberger

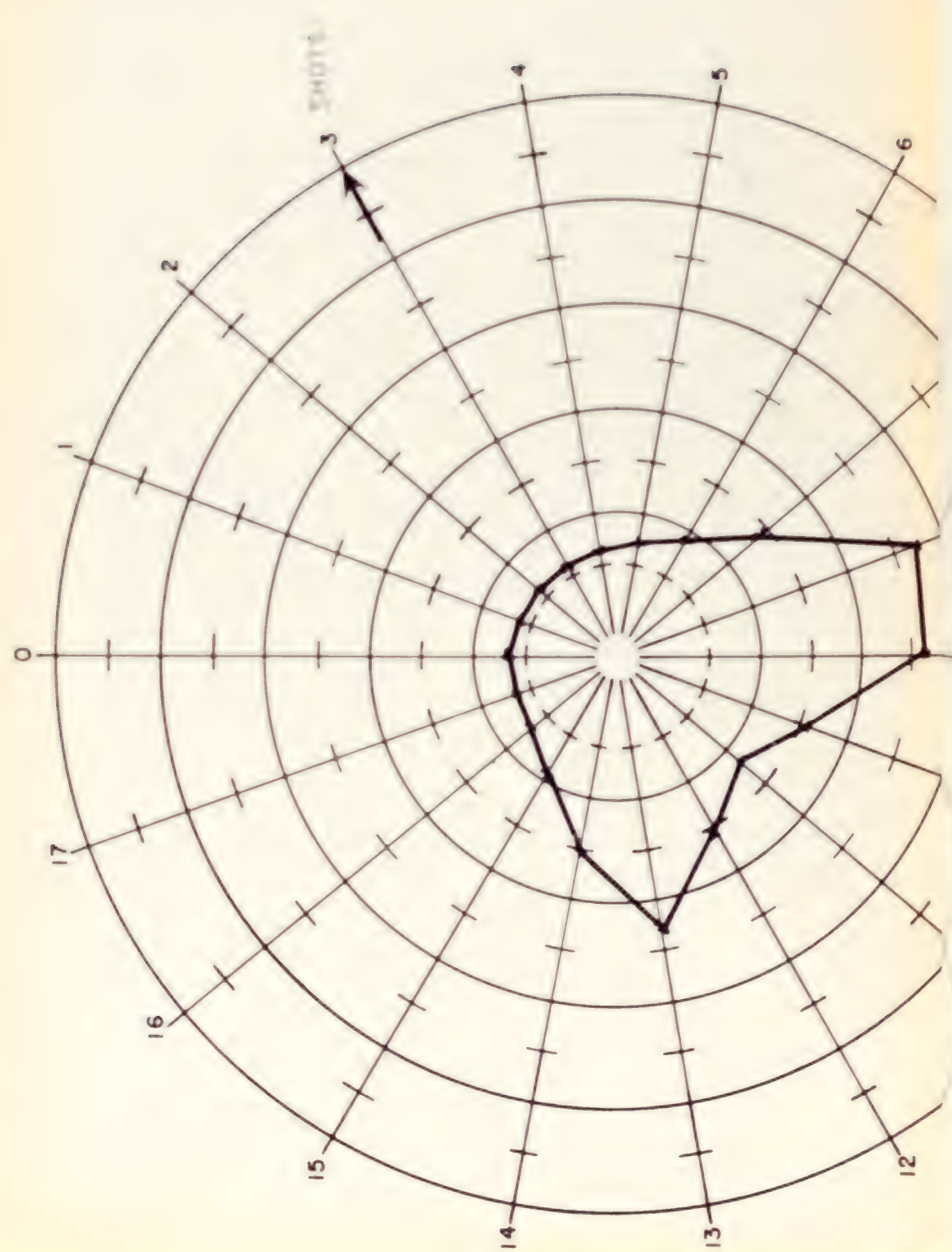
RADIO-ORIENTATION PLOT

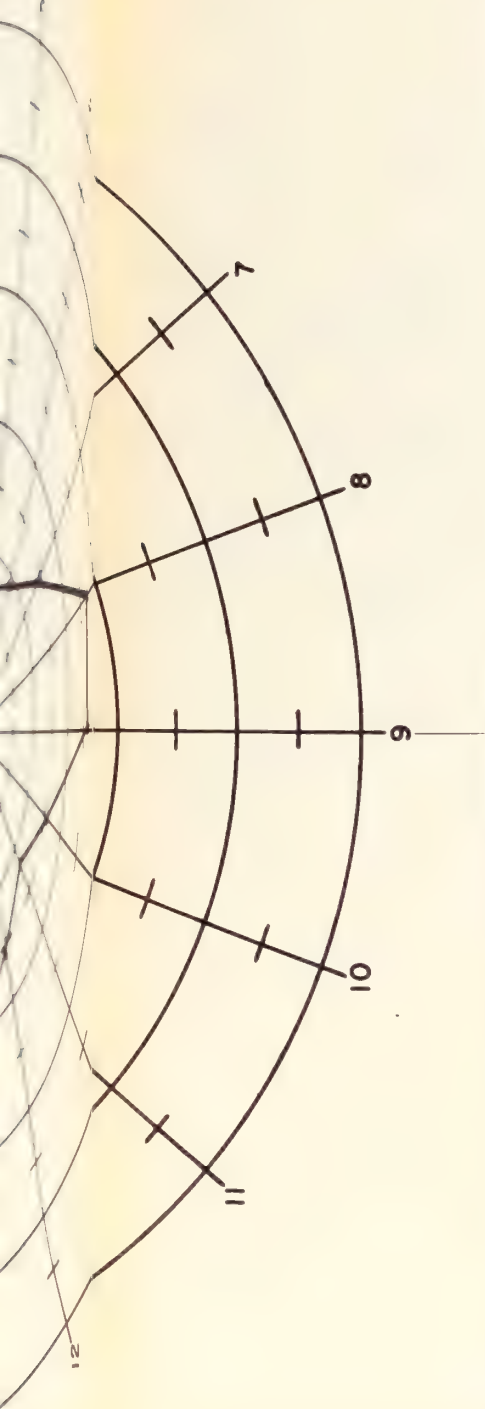
POT-B

3. SHORT STRING PERFORATED 1150-1160 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988. 989. 990. 991. 992. 993. 994. 995. 996. 997. 998. 999. 1000.





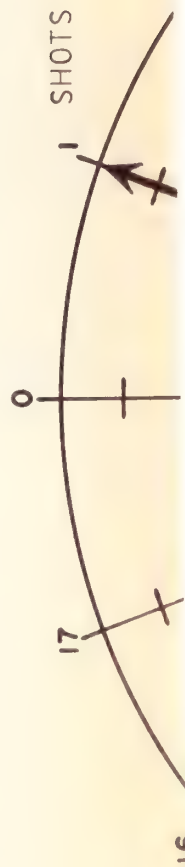
ent, computation and/or interpretation of our readings from our gamma-gamma orientation and de-
 instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
 set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
 of our Service Order for this job. The readings could be adversely affected by vagrant metal in the
 ore and other conditions unknown to us.

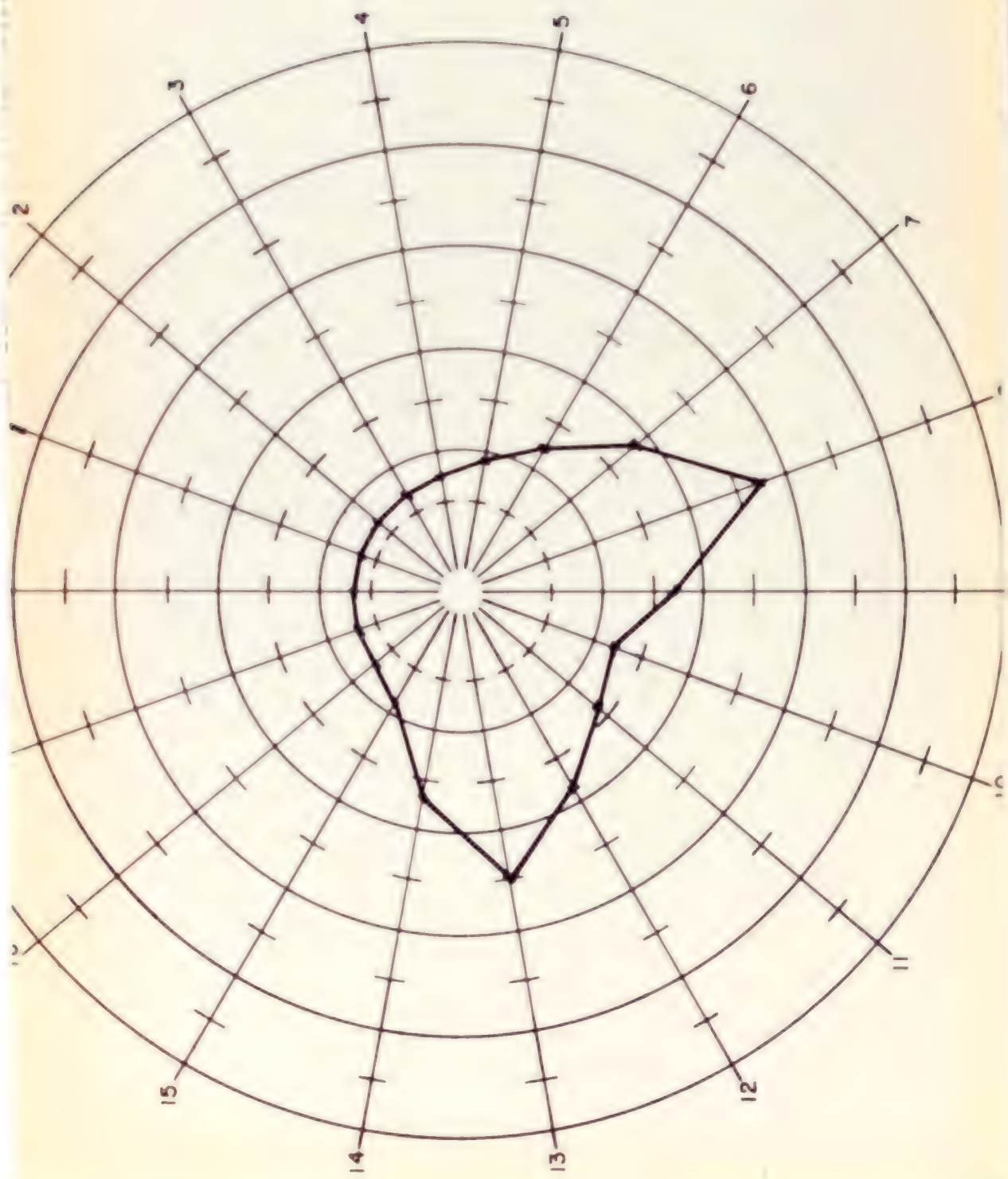
Schlumberger

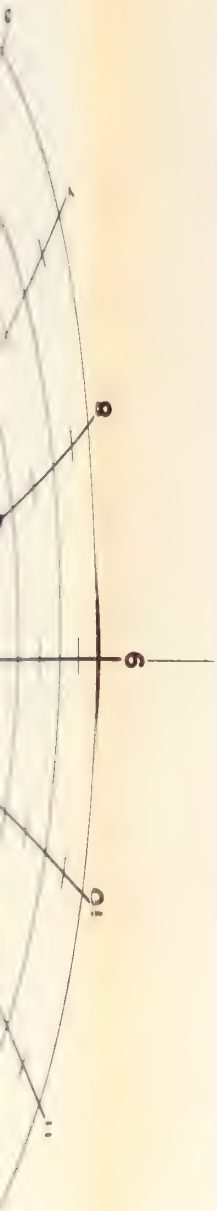
RADIO-ORIENTATION PLOT

POT-B

3. SHORT STRING PERFORATED 1150-1160 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME







rt, computation and/or interpretation of our readings from our gamma-gamma orientation and de-
 nstrument is presented to you in accordance with, but subject to, the General Terms and Conditions
 set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
 our Service Order for this job. The readings could be adversely affected by vagrant metal in the
 e and other conditions unknown to us.

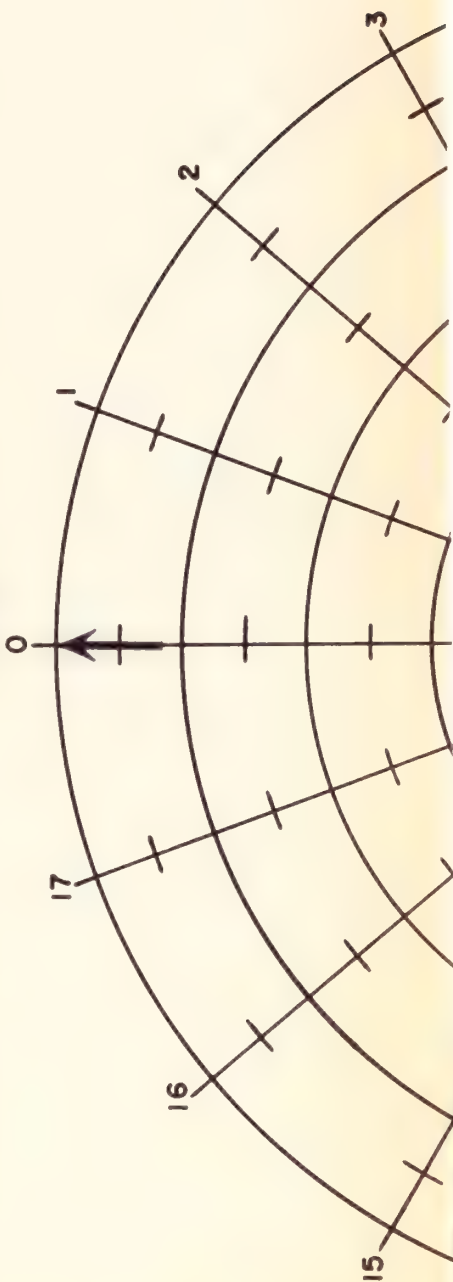


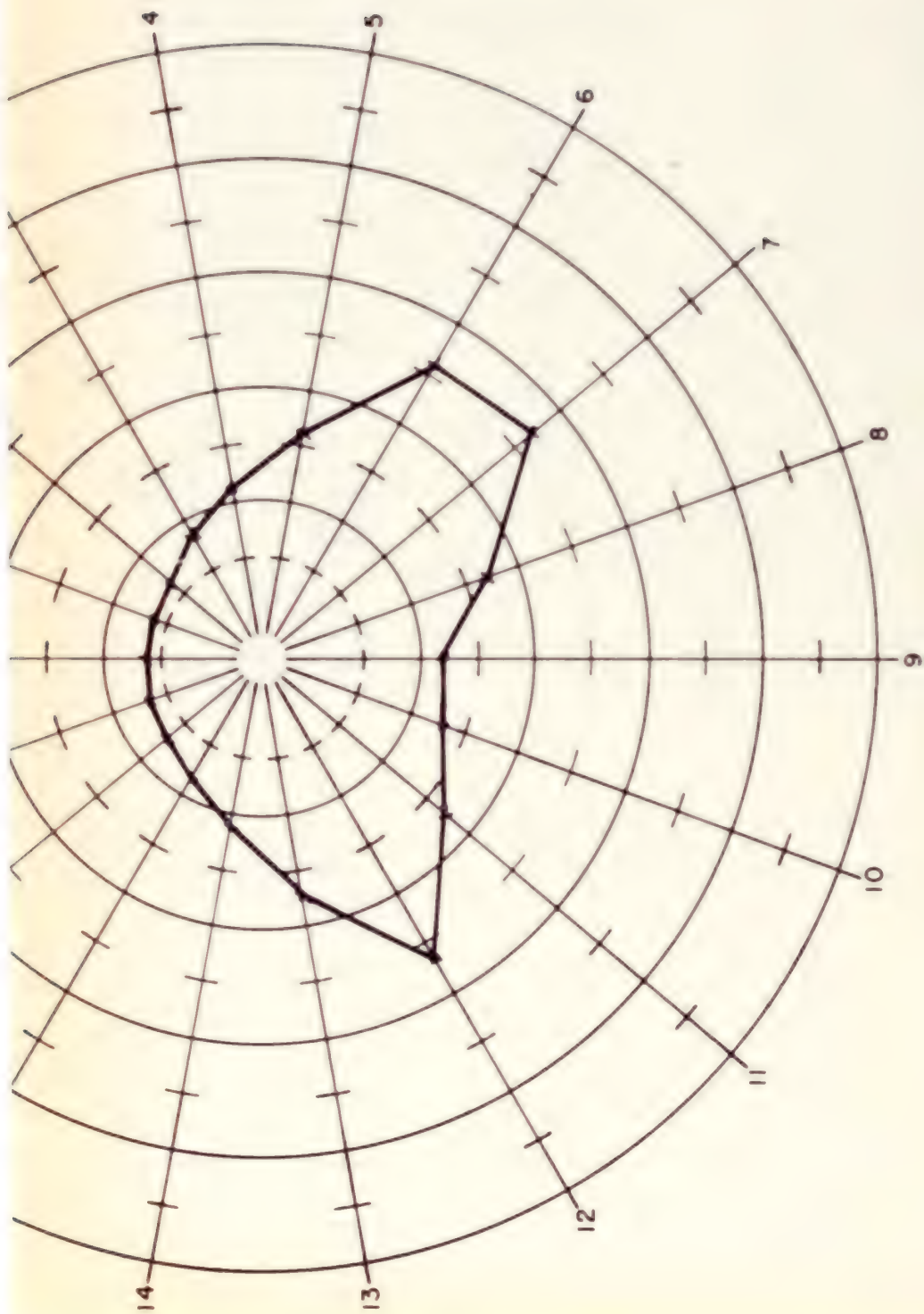
RADIOORIENTATION PLOT

POT-B

3-SHORT STRING PERFORATED 1139-1149 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

SHOTS





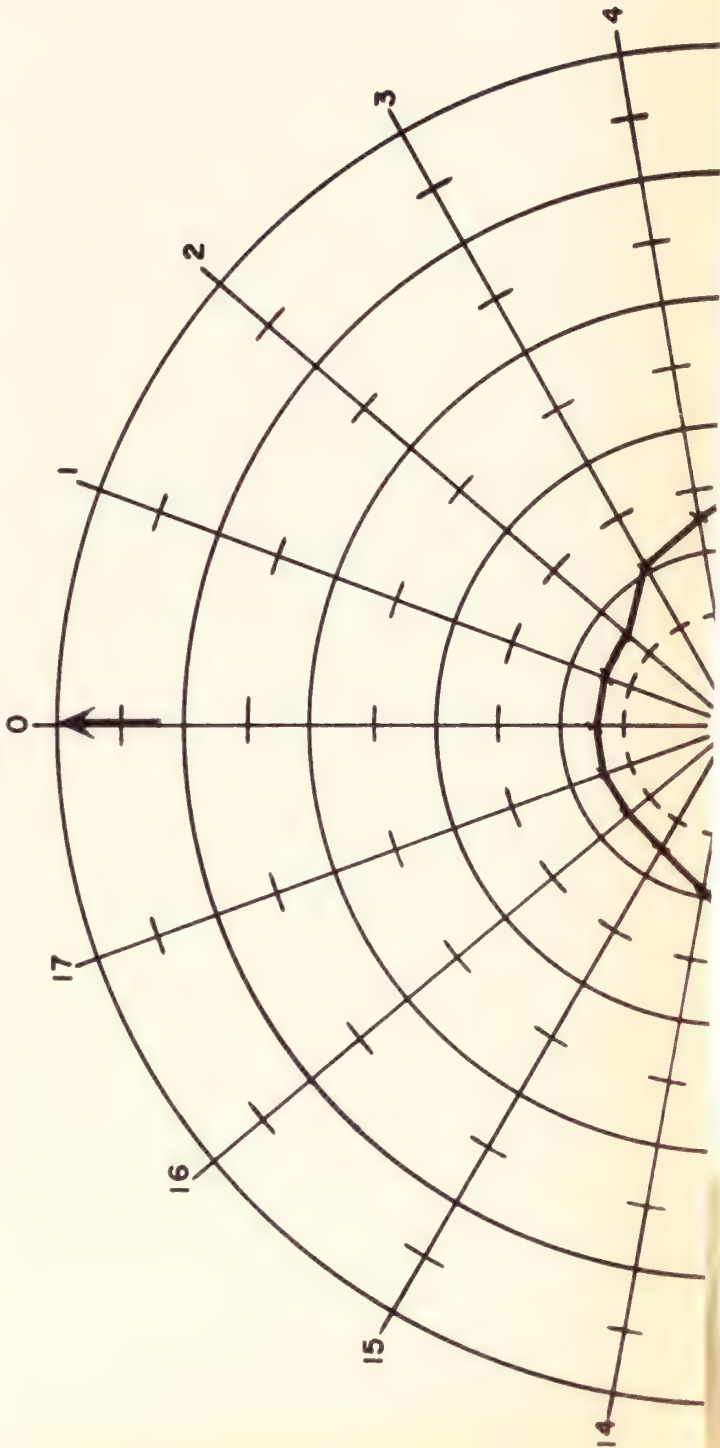
1. The curve is plotted on a Schlumberger resistivity chart. The curve starts at approximately 4.5 on the 4 line, rises to a peak of about 6.5 on the 5 line, then descends to a minimum of about 3.5 on the 10 line, and finally rises to about 4.5 on the 14 line.

RADIOORIENTATION PLOT

POT-B

0.3 SHORT STRING PERFORATED 1128-1138 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

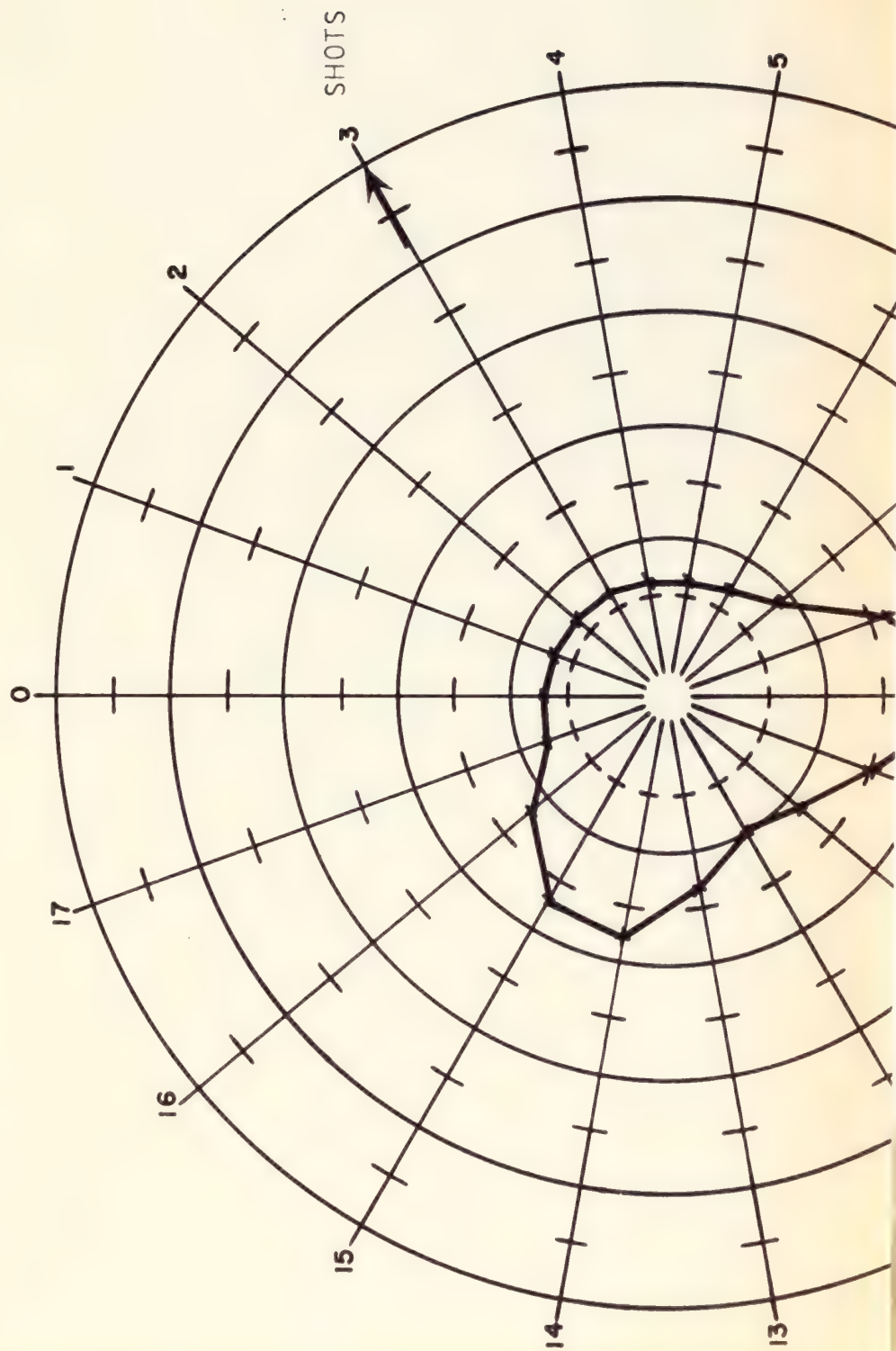
SHOTS

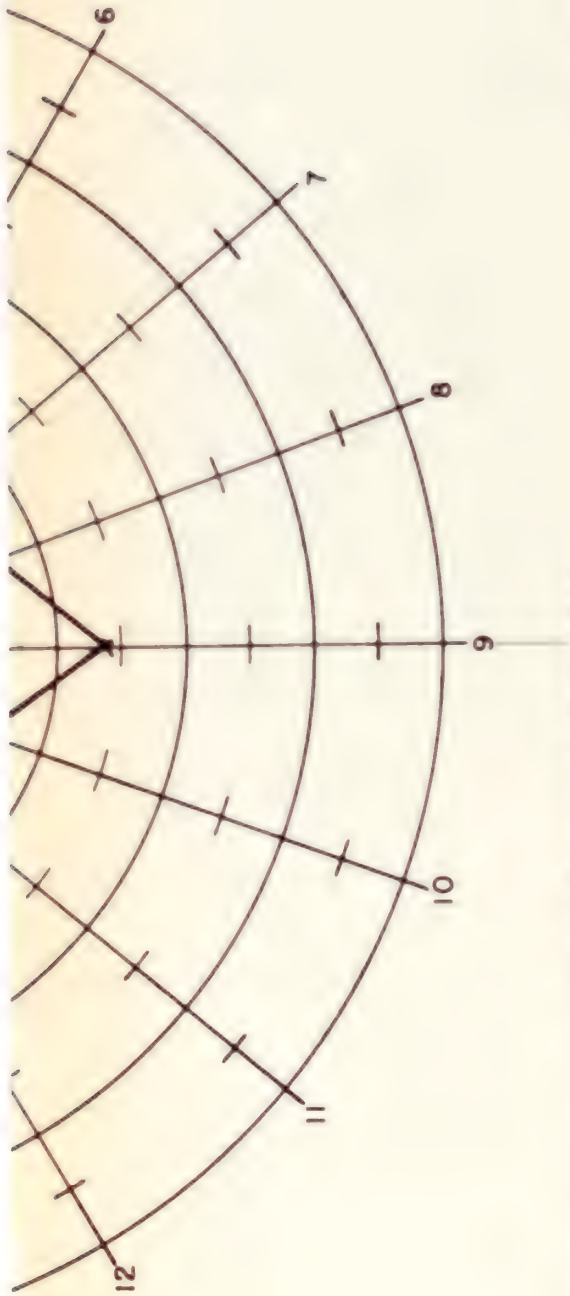


RADIO-ORIENTATION PLOT

POT-B

NO. 3 SHORT STRING PERFORATED 1117-1127 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma camera observation and the reading instrument is presented to you in good faith with but subject to the foregoing terms and conditions as are set out on pages 1 and 2 of our current Price Schedule and which are set out at the bottom side of our Service Order for this job. The readings could be adversely affected by changes made in the drill hole and other conditions unknown to us.

Schlumberger

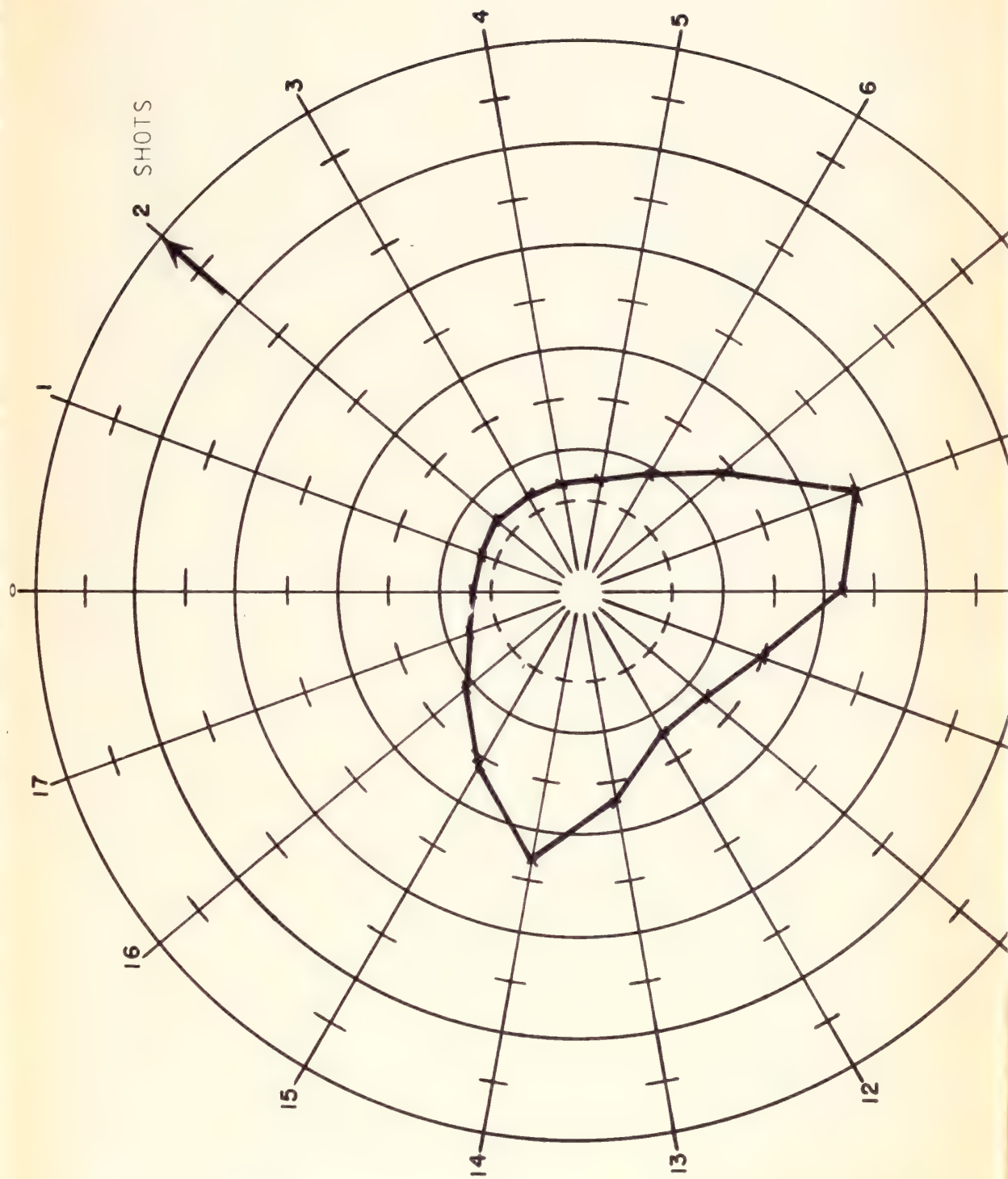
RADIOORIENTATION PLOT

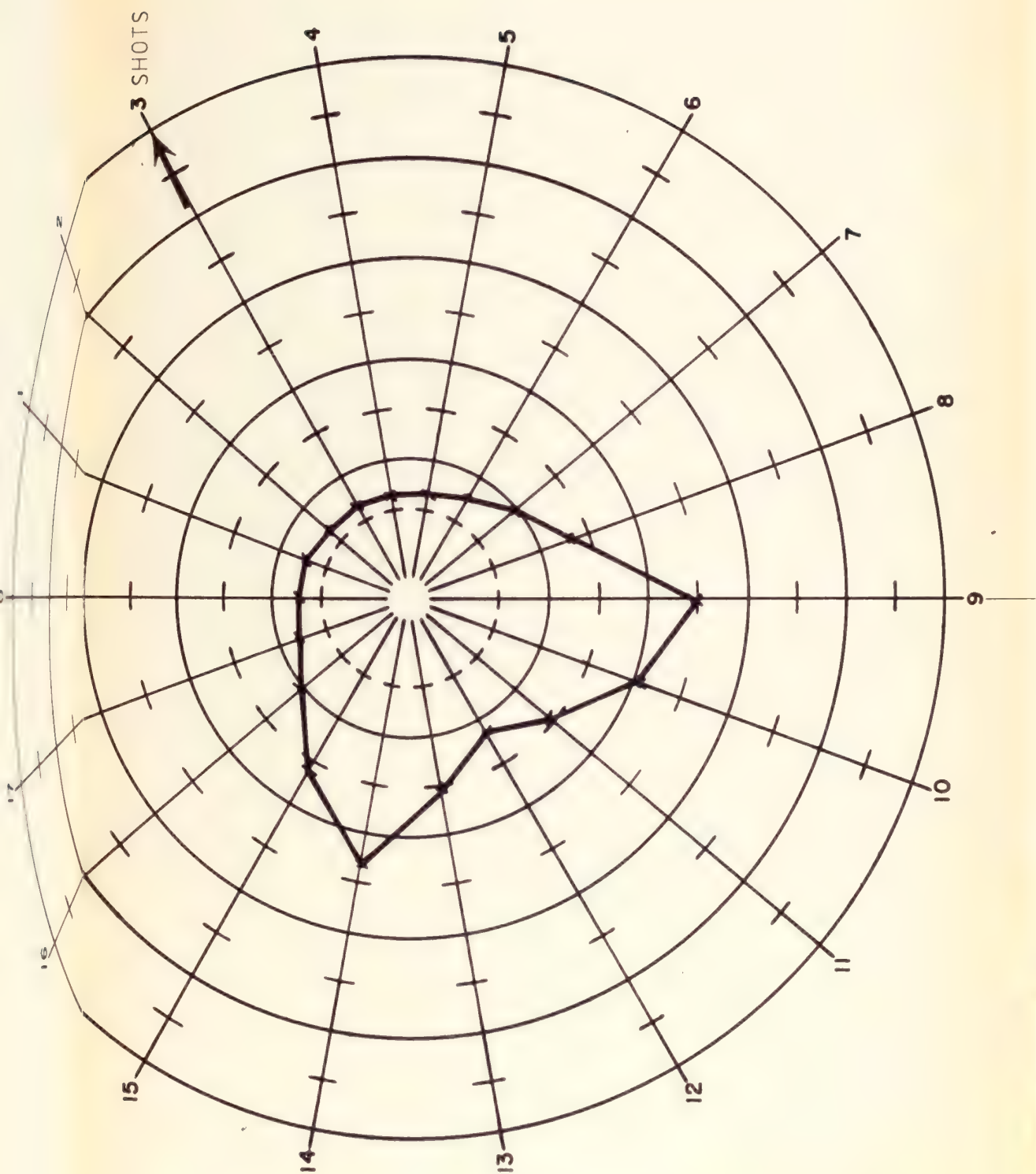
POT-B

NO. 3-SHORT STRING PERFORATED 1106-1116 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

0

RADIORIENTATION PLOT



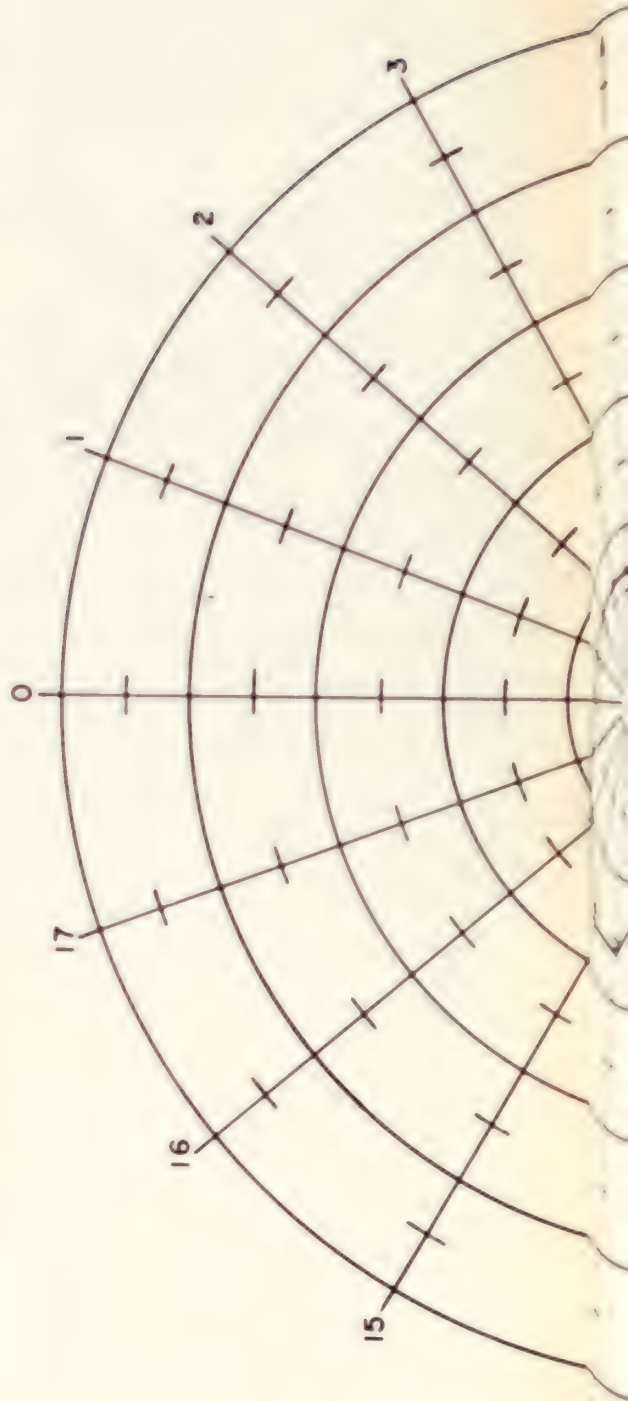


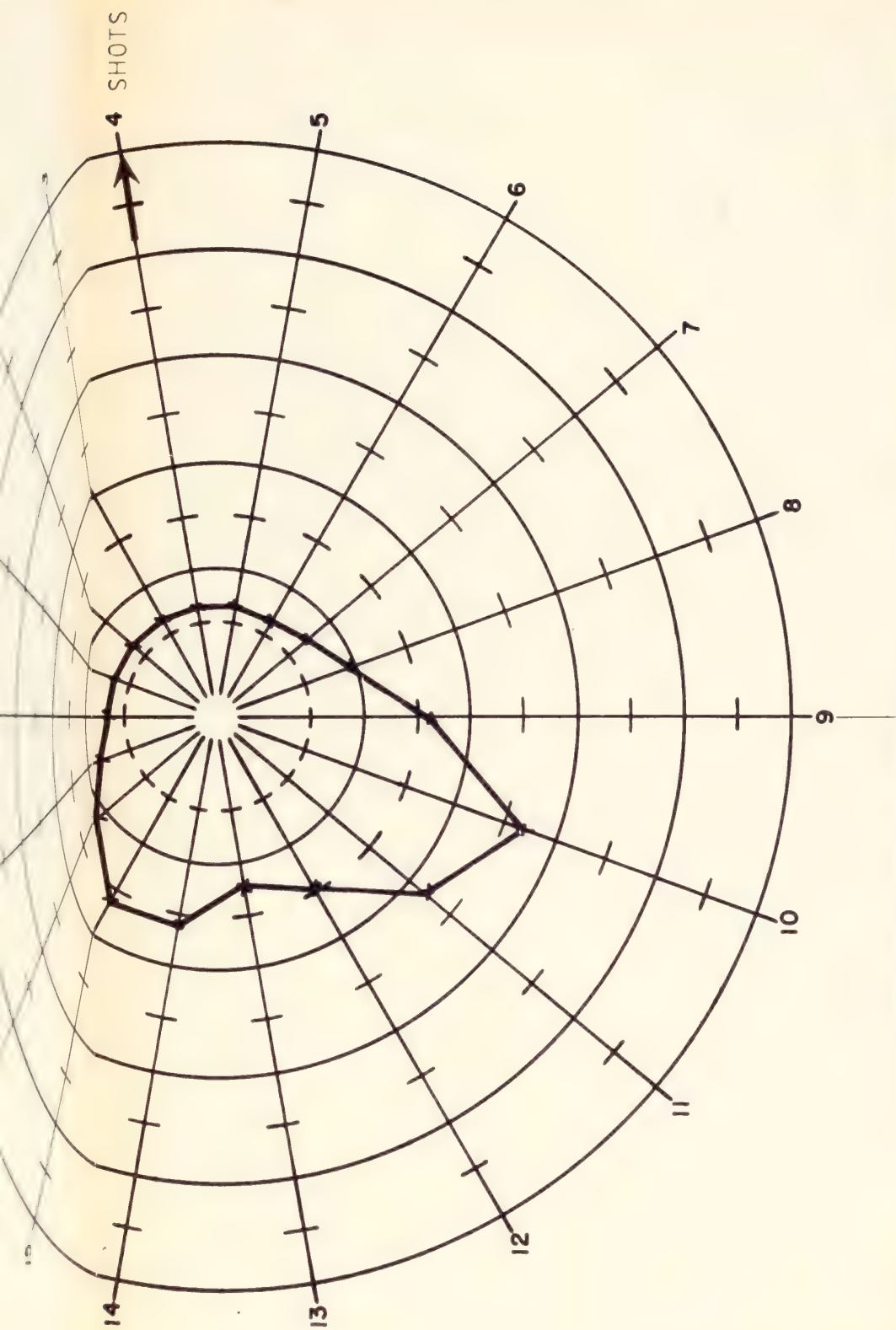
On the morning of 11 July 1941, just after dawn, the German commandos landed on the beach. They had no air support and they were outnumbered. The British soldiers, who were not fully trained in amphibious warfare, fought bravely but were overwhelmed by the superior tactics and equipment of the Germans. The British soldiers were killed or captured, and the German commandos successfully landed on the beach.

RADIO-ORIENTATION PLOT

POT-8

0.15% STRAIN PERFORMED 1000-1004, ONE SHOT RUN COM WITH 1 1/2" W/24059





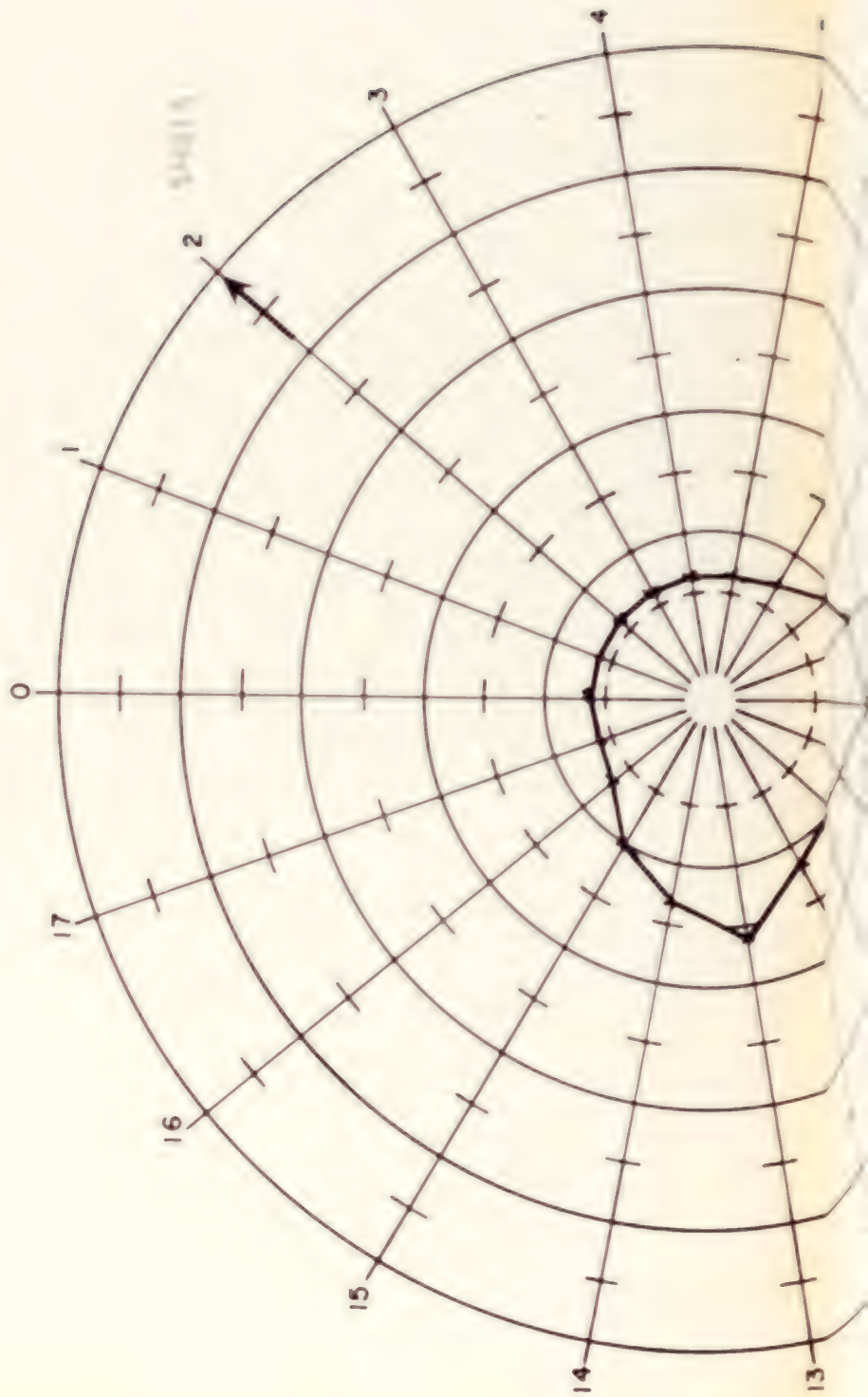
Schlumberger

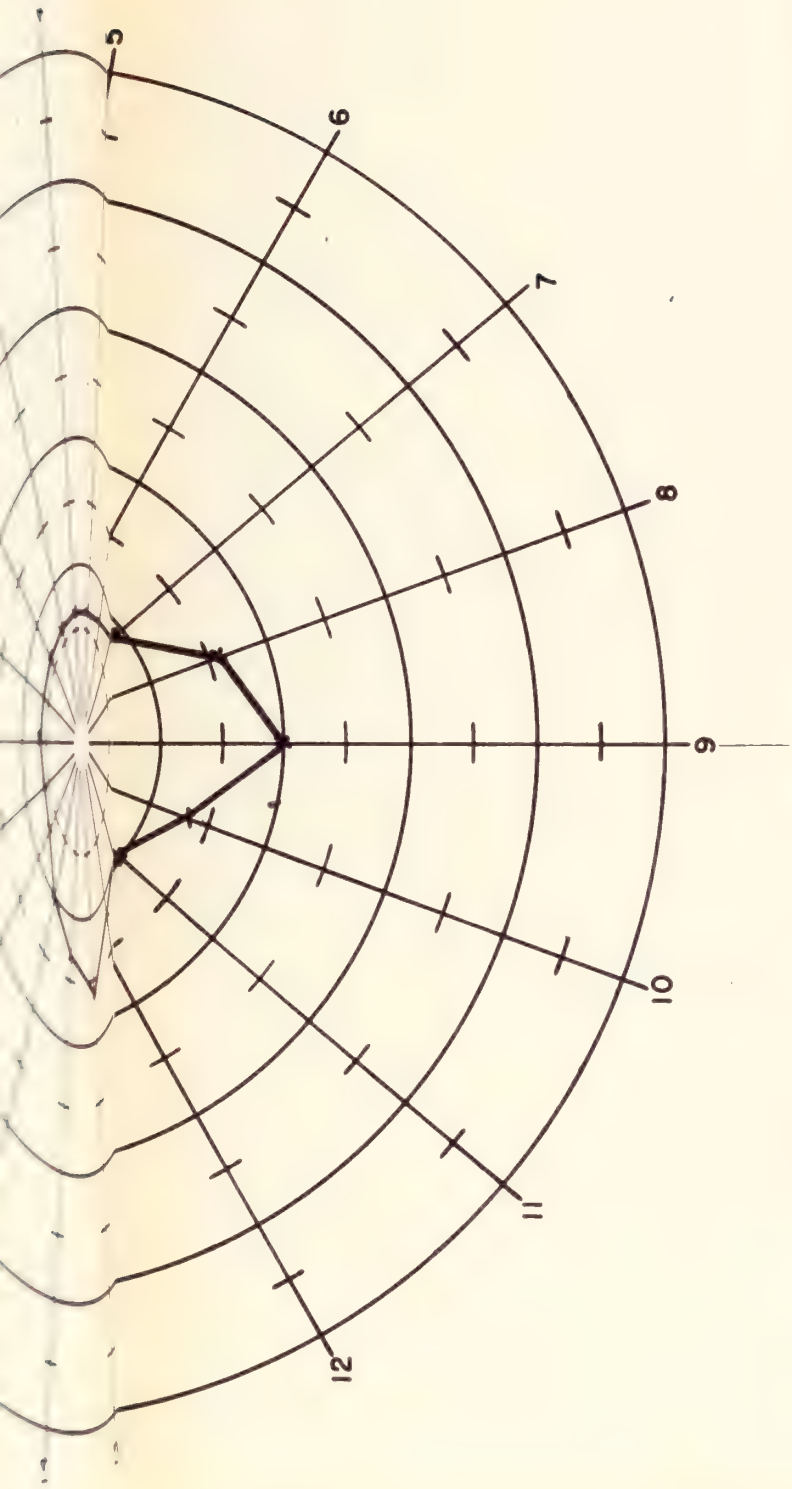
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-8

NO. 3 SHORE SINK PERFORMED 1070-1000 ON 5/12/68 FOR FOOT WITH 1 1/2" HOLE

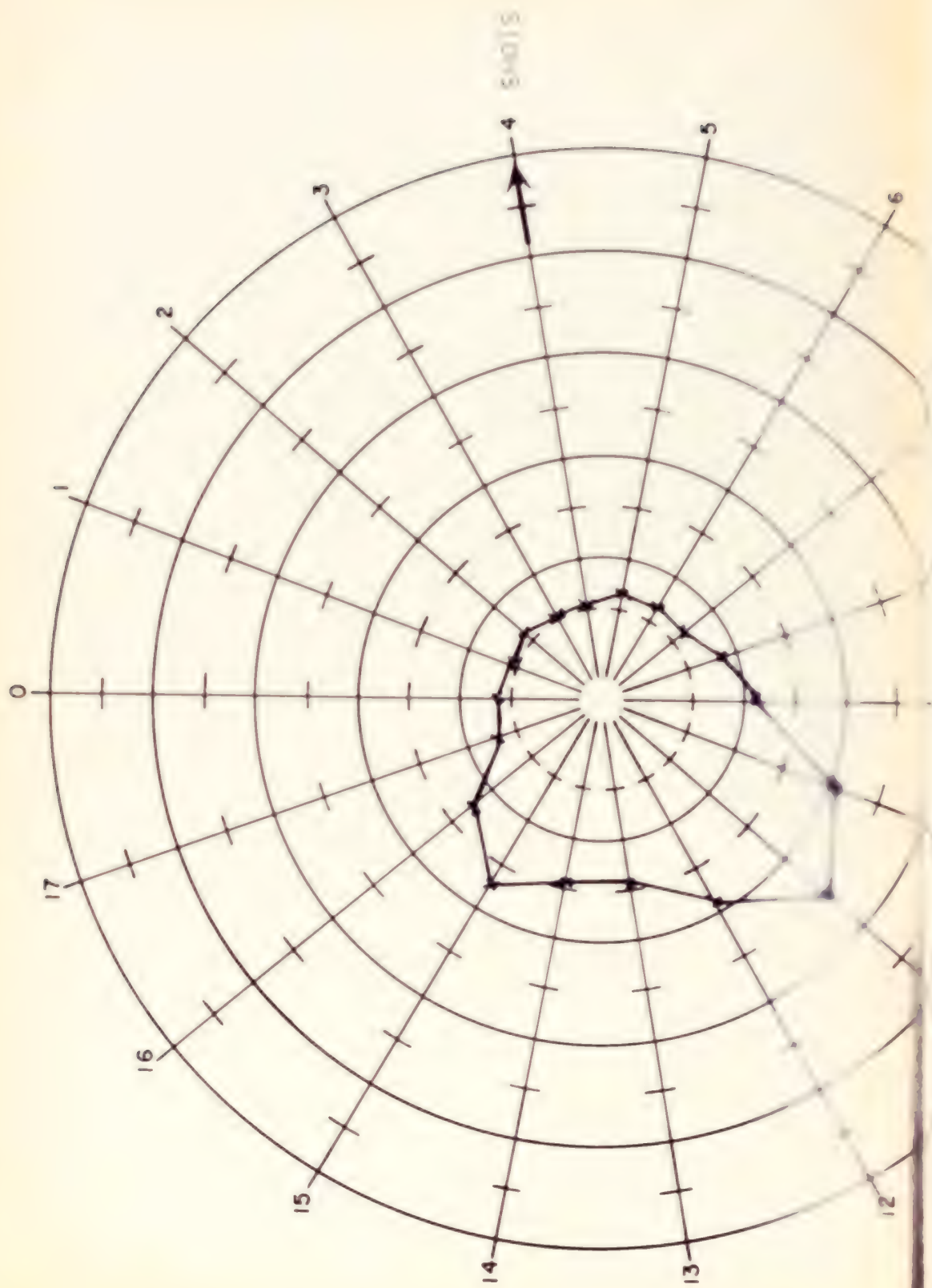


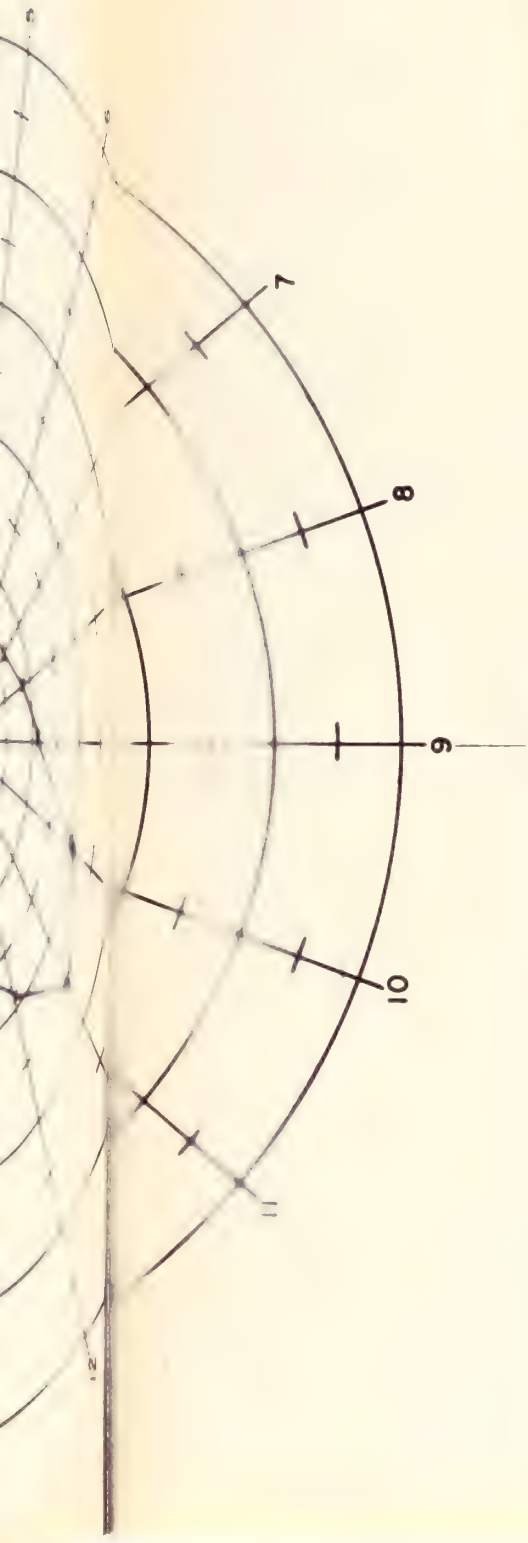


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIO-ORIENTATION PLOT
POT-B



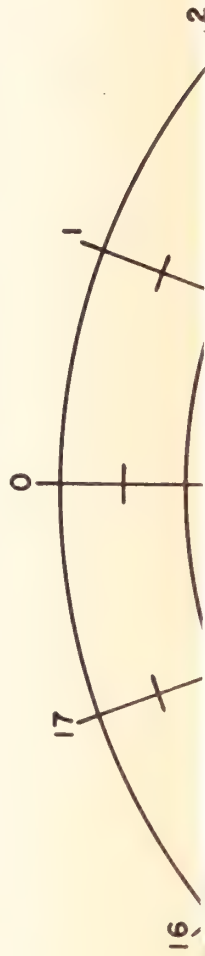


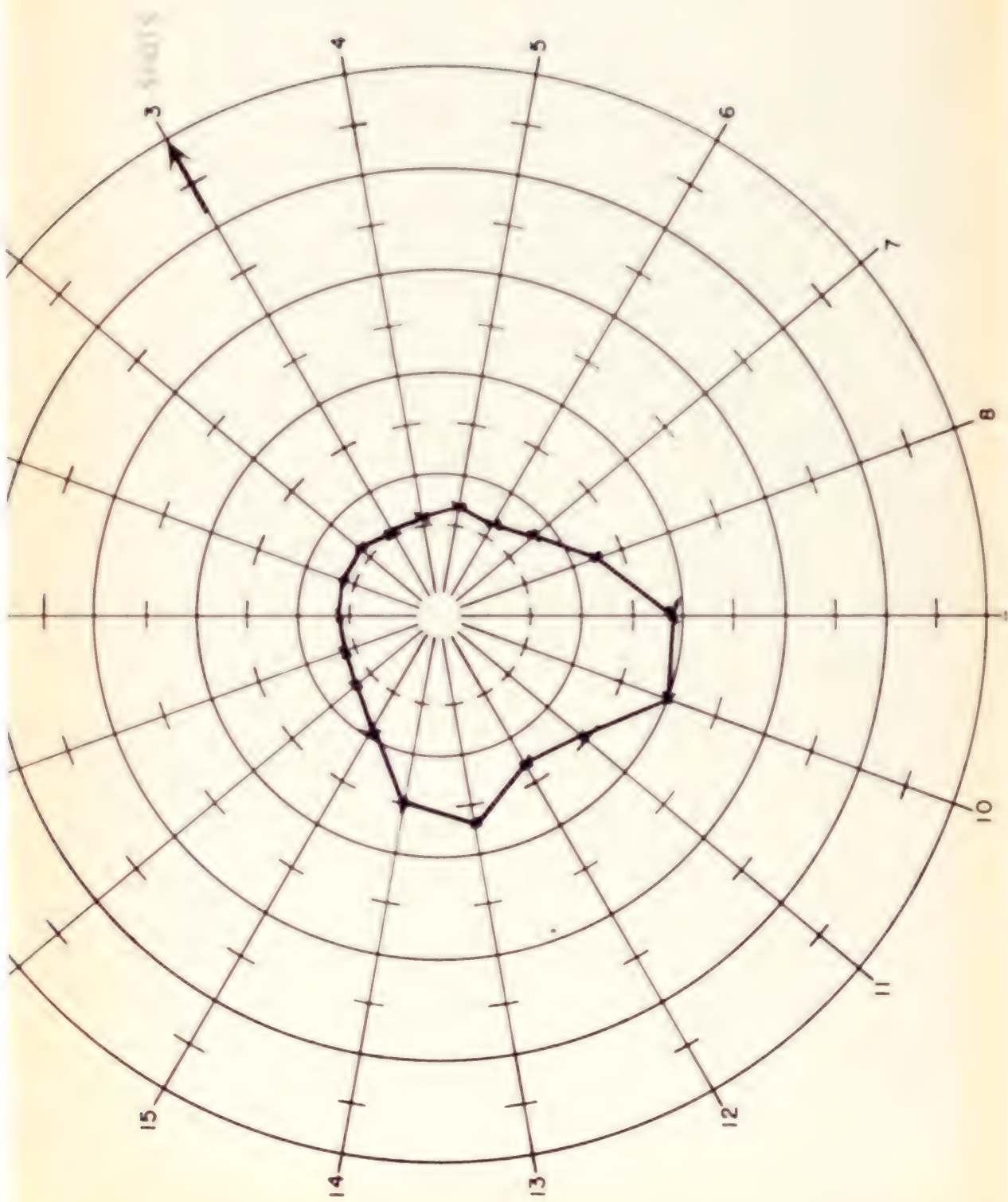
is that, computation and or interpretation of our readings from our gamma-gamma orientation and de-
 viding instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
 are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
 side of our Service Order for this job. The readings could be adversely affected by variant metal in the
 all hole and other conditions unknown to us



RADIOORIENTATION PLOT POT-B

NO. 3 SHORT SIRINI PERFORATED 1957-1967 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME







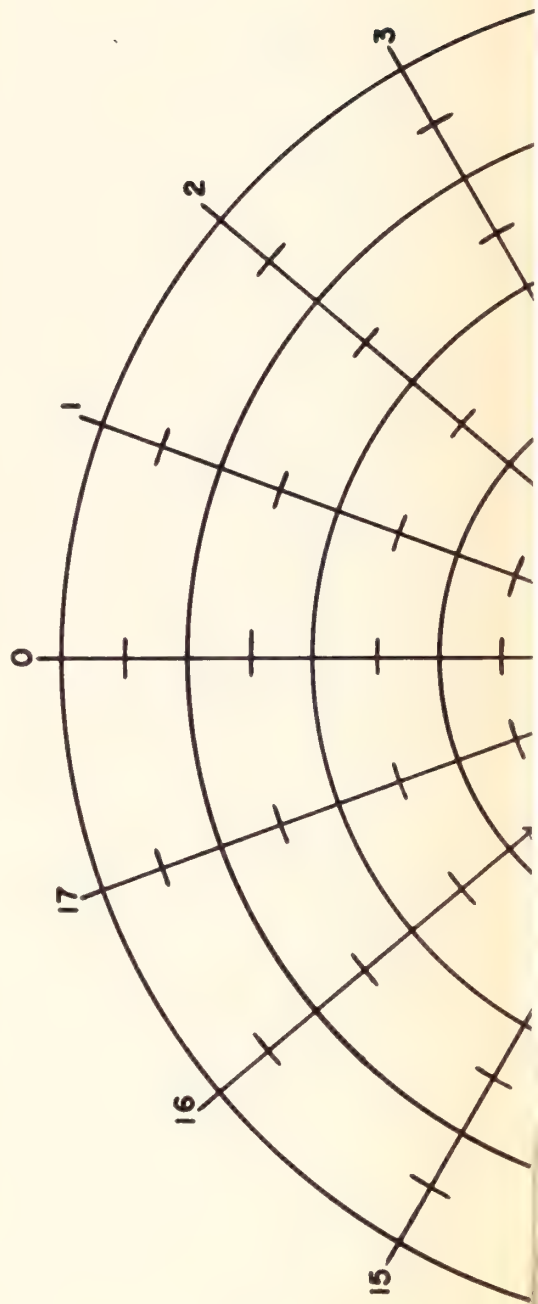
s chart, computation and/or interpretation of our readings from our gamma-gamma orientation and de-
 scribing instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
 are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
 le of our Service Order for this job. The readings could be adversely affected by vagrant metal in the
 all hole and other conditions unknown to us.

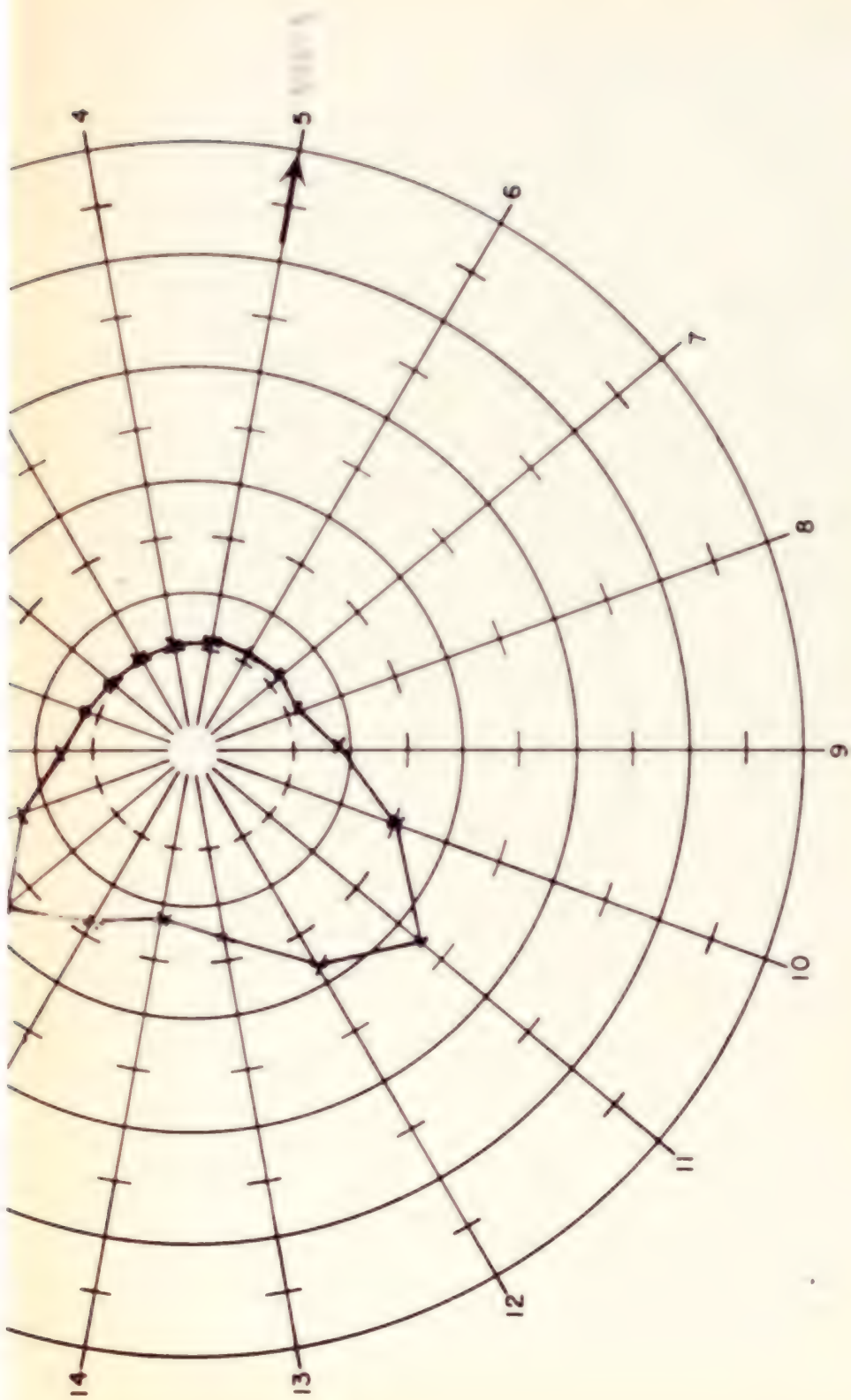


RADIOORIENTATION PLOT

POT-B

NO. 3 SHORT STRING PERFORATED 1050-1056 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



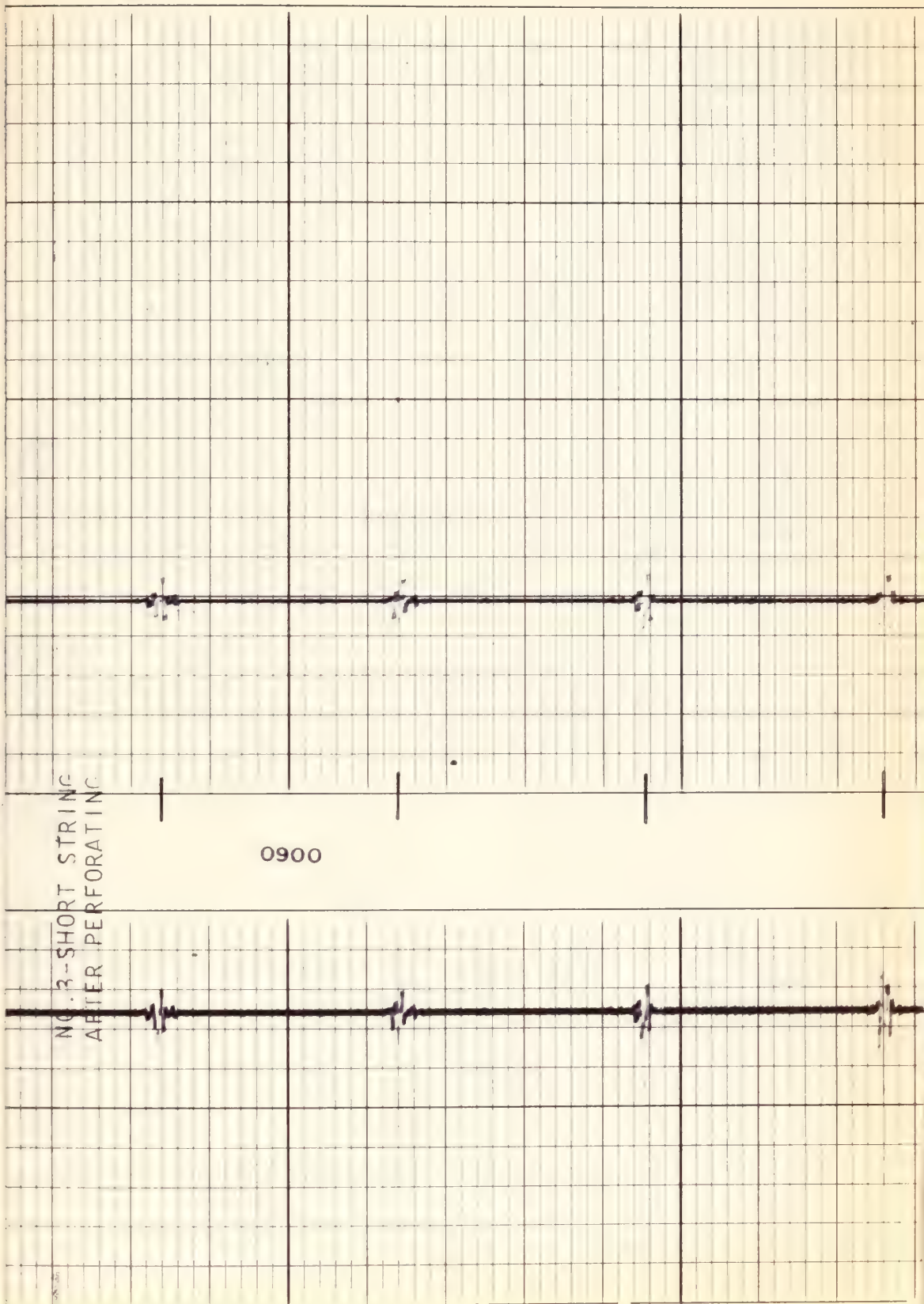


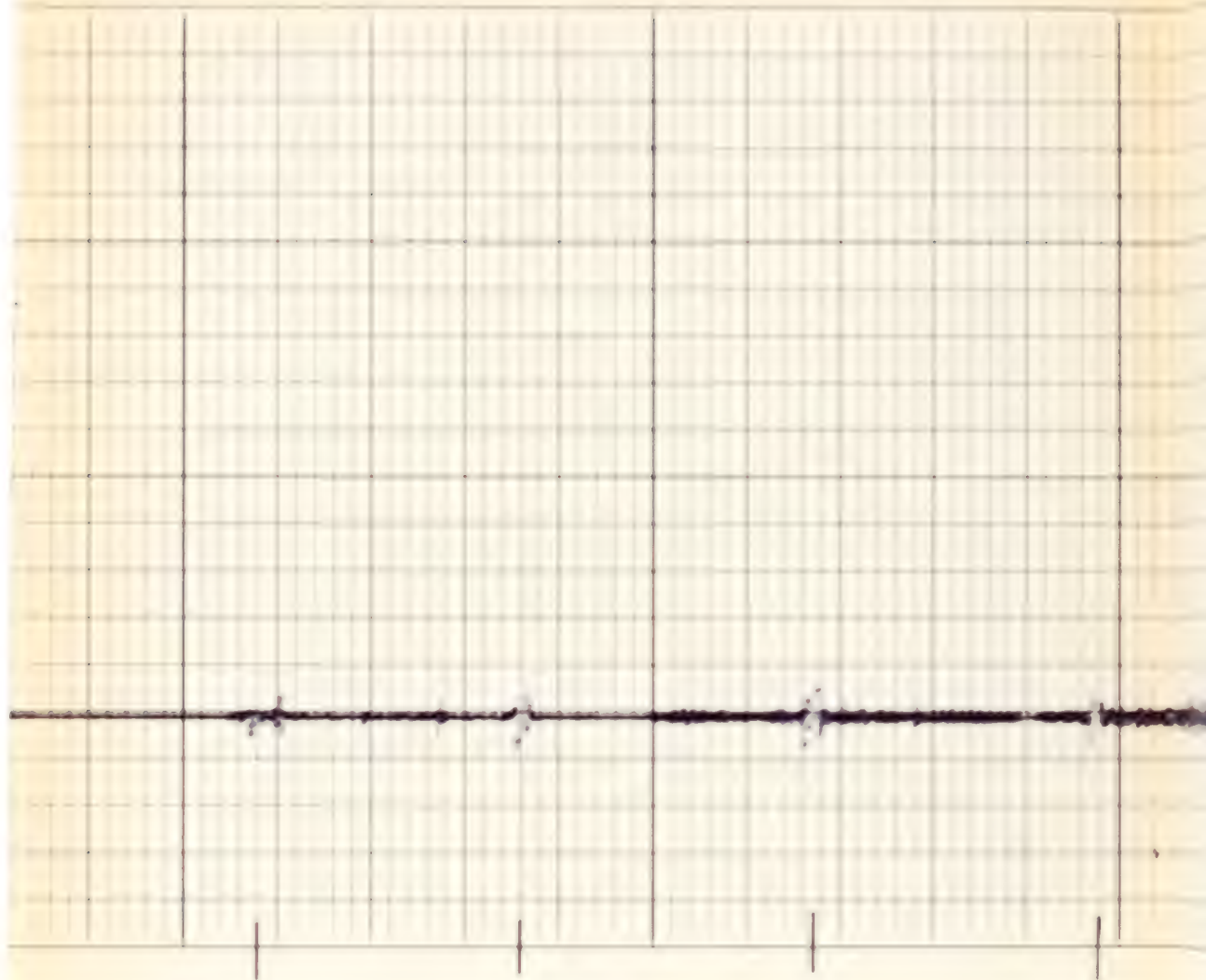
This chart, computation and/or interpretation of our readings from our ground ground, is subject to the testing instrument is presented to you in accordance with, but subject to the ground ground, and conditions as we set out on pages 1 and 2 of our ground ground. We are not responsible for any and all the results of our ground ground for this job. The readings could be obtained by other means if the drill hole and other conditions unknown to us.



NO. 3 - SHORT STRING
AFTER PERFORATING

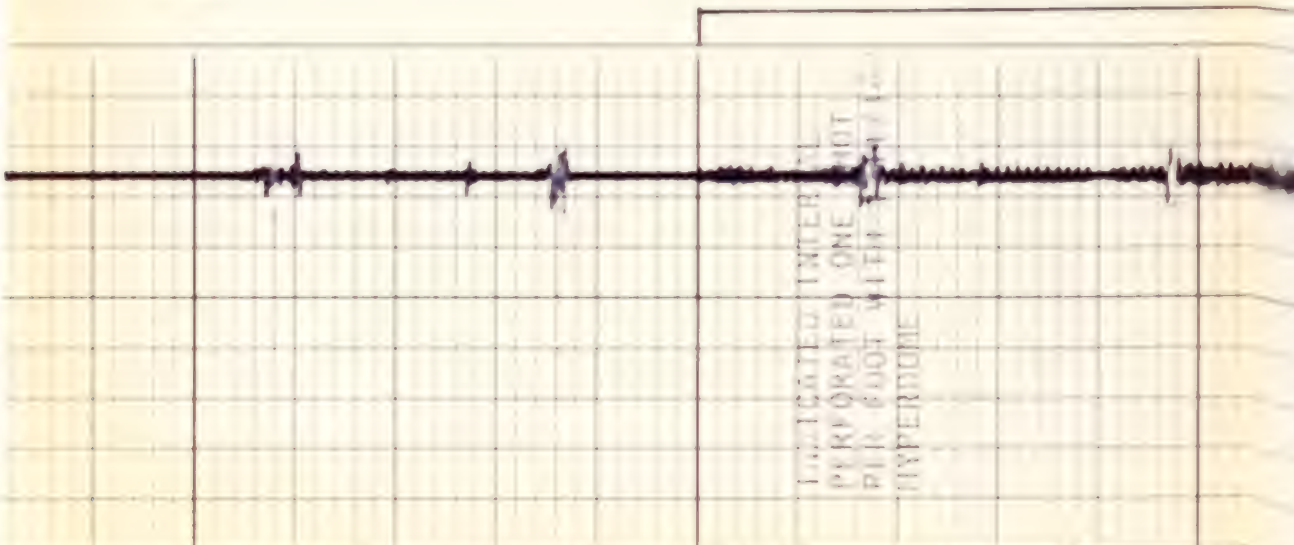
0900



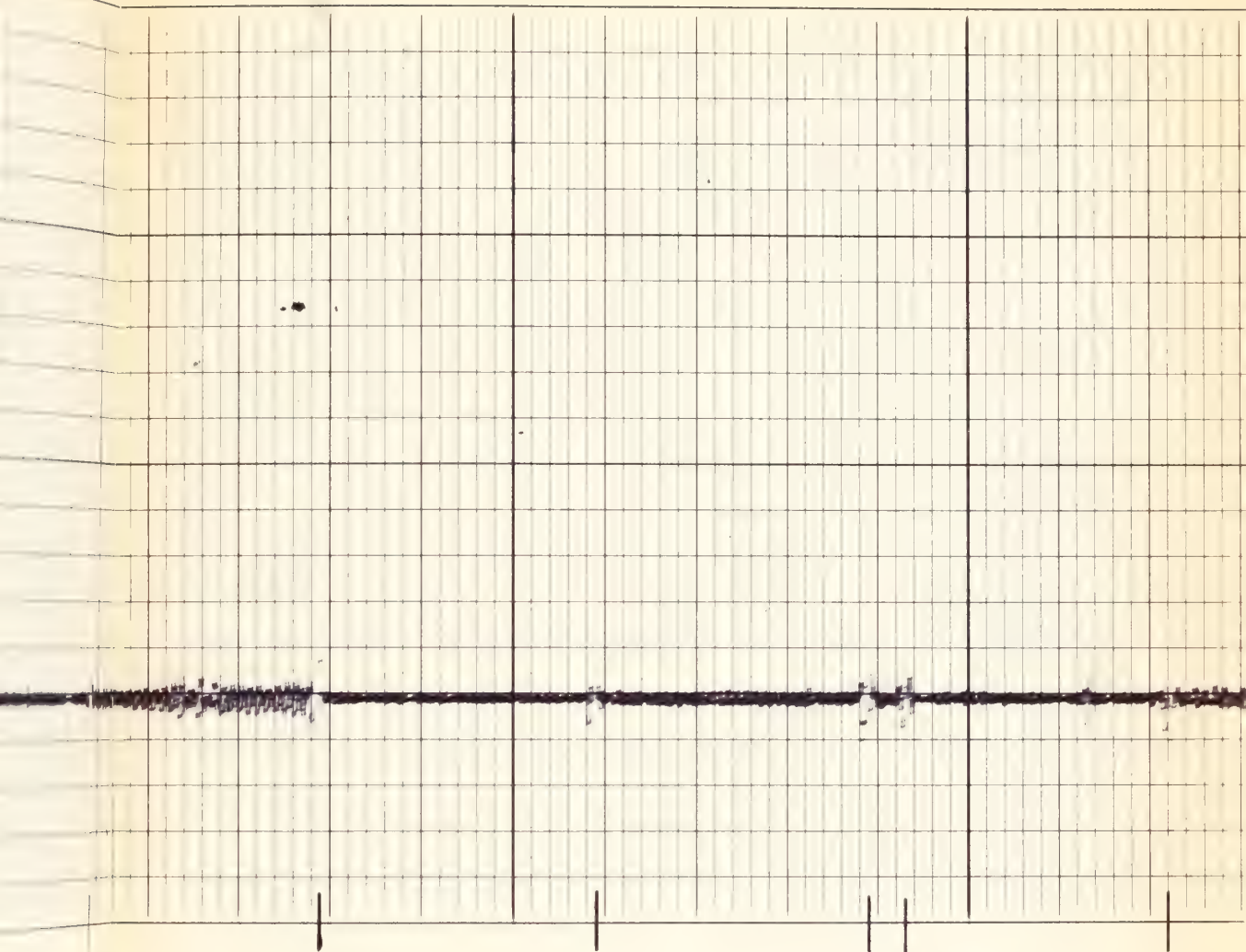


1000

1100

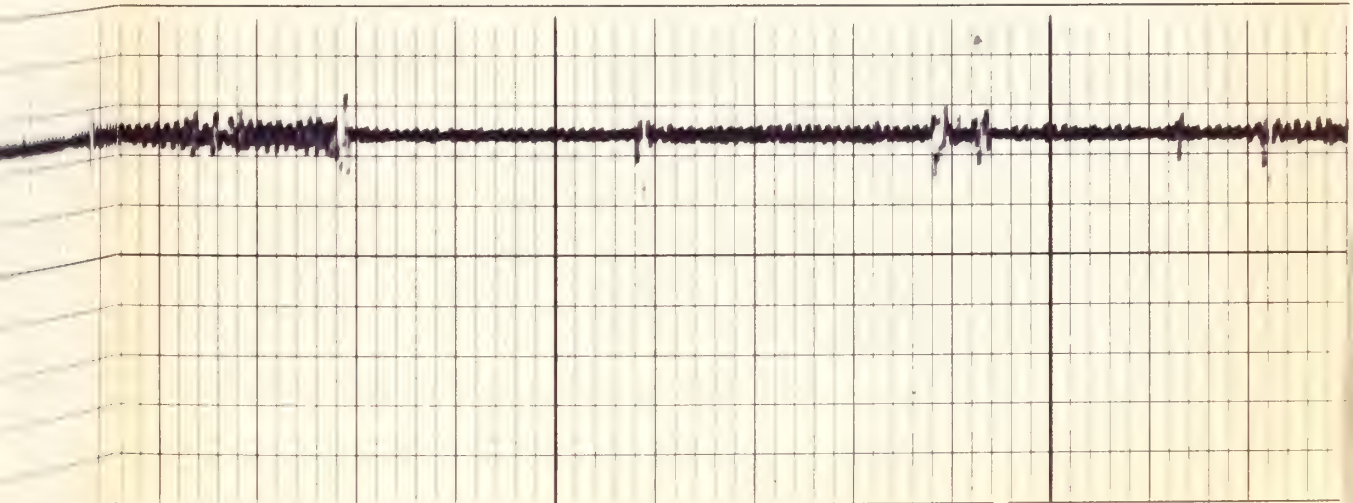


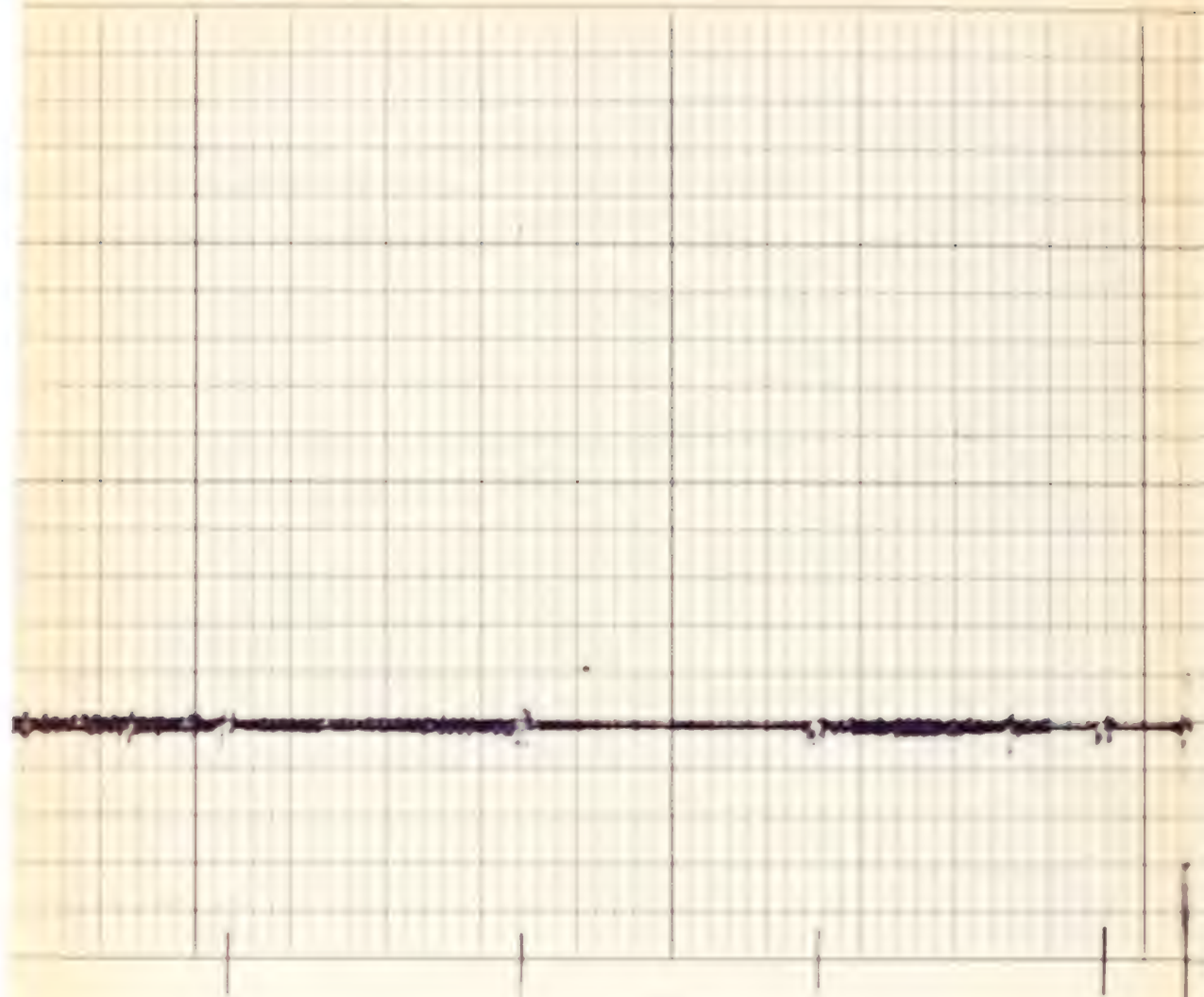
INDICATED INTER-
PERFORATED ONE (NOT
PIN FOOT WITH
HYPERDOME



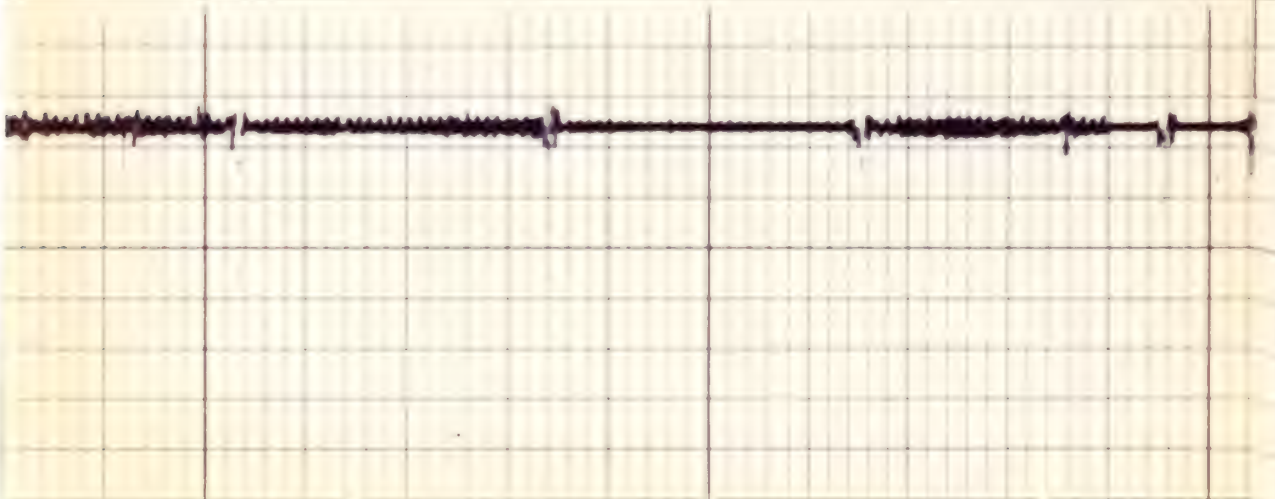
100

1200





1300



COMPANY ATLANTIC RICHFIELD COMPANY

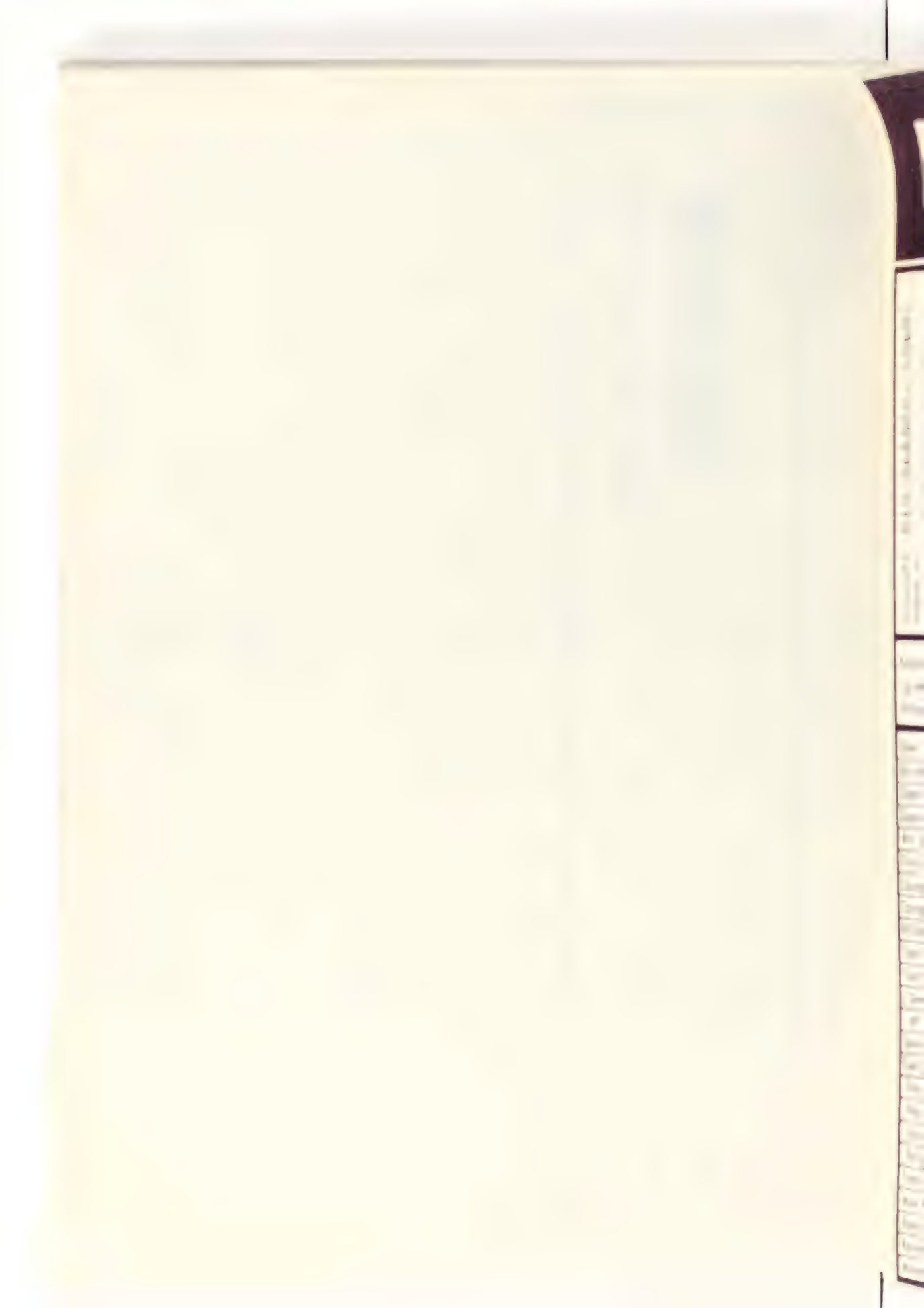
WELL AT-1C

FIELD CORGHUM RULCH

RIO BLANCO, COLORADO



PRODUCTION LOGGING SERVICES



SIMULTANEOUS

Schlumberger

COMPENSATED NEUTRON-
FORMATION DENSITY

COUNTY RIO BLANCO, COLO.
 FIELD or LOCATION SORGHAM GULCH
 WELL AQUIFER TEST #1-C
 COMPANY ATLANTIC RICHFIELD

COMPANY THE ATLANTIC RICHFIELD COMPANYWELL AQUIFER TEST #1-CFIELD SORGHAM GULCHCOUNTY RIO BLANCO STATE COLORADO

Location: API Serial No. _____

Other Services:

DIL
 BHC-GR
 HRT

Sec. 7 Twp. 3 - SRge. 96-W

Permanent Datum: GL; Elev.: 6909
 Log Measured From GL, _____ Ft. Above Perm. Datum
 Drilling Measured From GL

Elev.: K.B. _____
 D.F. _____
 G.L. 6909

| | | | | | | | |
|-------------------------------|-----------------|----|-----|----|-----|----|--------|
| Date | 8/18/74 | | | | | | |
| Run No. | ONE | | | | | | |
| Depth-Driller | 1640 | | | | | | |
| Depth-Logger | 1646 | | | | | | |
| Btm. Log Interval | 1645 | | | | | | |
| Top Log Interval | 61 | | | | | | |
| Casing-Driller | 8-5/8 @ 59 | | | @ | @ | @ | @ |
| Casing-Logger | 61 | | | | | | |
| Bit Size | 7-7/8 | | | | | | |
| Type Fluid in Hole | WATER | | | | | | |
| Fluid Level | 440 | | | | | | |
| Dens. | Visc. | | | | | | |
| pH | Fluid Los | | ml | | ml | | ml |
| Source of Sample | | | | | | | |
| R _{mm} @ Meas. Temp. | (a) | °F | (a) | °F | (a) | °F | (a) °F |
| R _{mf} @ Meas. Temp. | (a) | °F | (a) | °F | (a) | °F | (a) °F |
| R _{mc} @ Meas. Temp. | (a) | °F | (a) | °F | (a) | °F | (a) °F |
| Source: R _{mf} | R _{mc} | | | | | | |
| R _m @ BHT | (a) | °F | @ | °F | (a) | °F | (a) °F |
| Time Since Circ. | 10 HOURS | | | | | | |
| Max. Rec. Temp. | 86 | °F | | °F | | °F | °F |
| Equip. | 5602 G.J. | | | | | | |
| Recorded By | BAGGHOUGH | | | | | | |
| Witnessed By | ELLARD, TAIT | | | | | | |

The well name, location and borehole reference data were furnished to the hydro-

SCALE CHANGES

[illegible]

22

| Matrix | Auto Hole- Size Corr. | Hole Size Setting (if not auto) | Parosity Scale | From | To |
|-----------|---|---------------------------------------|-------------------|------|----|
| LIMESTONE | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | | 20/TK | TD | LE |
| | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | |

Run No. ONE

[illegible]

Service Order No 15129

| Bit | From | To | Csq Size | Csq Wt | From | To |
|-----|------|----|----------|--------|------|----|
| | | | | | | |

GAMMA RAY

API UNITS

6

16

CALIPER

HOLE DIAM. IN INCHES

DEPTHS

LIMESTONE MATRIX

60

45

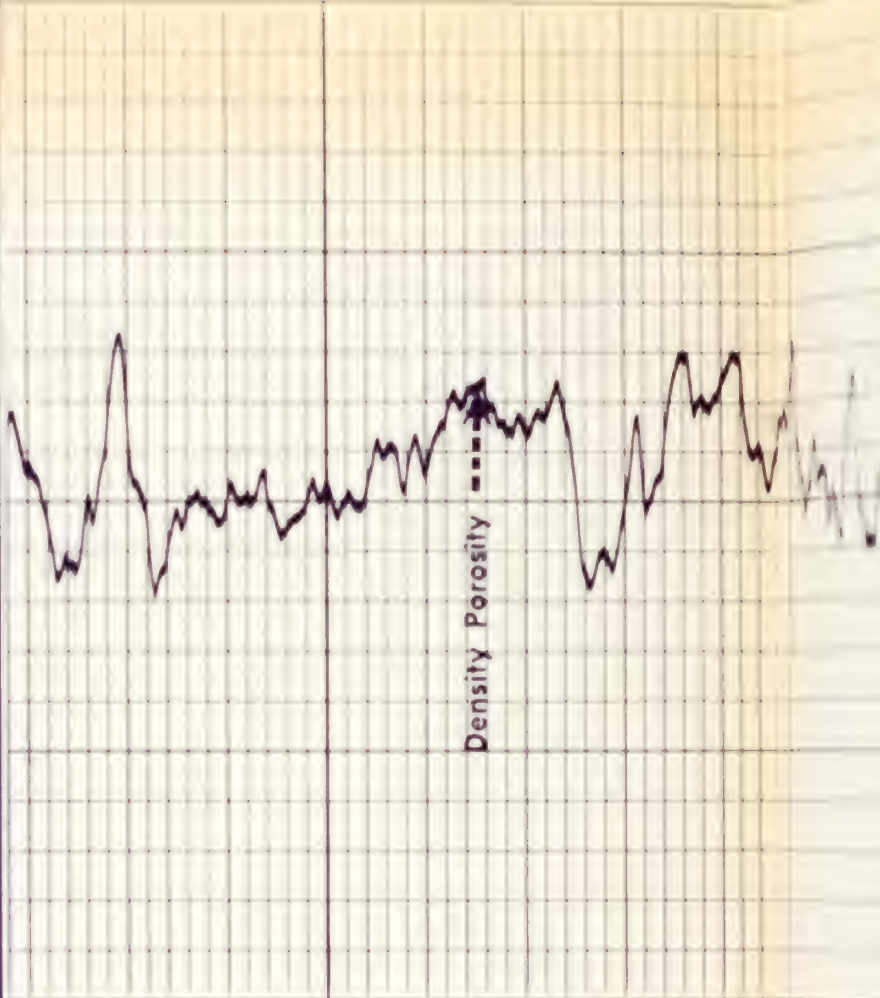
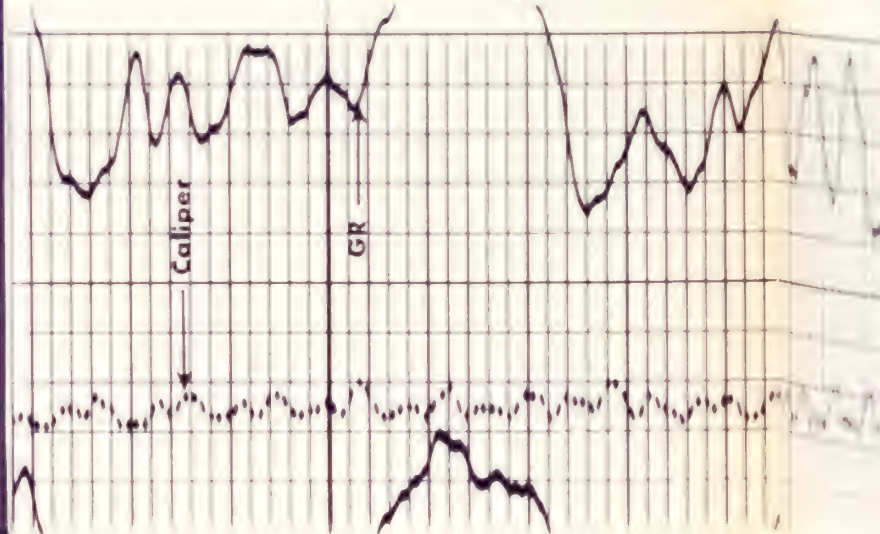
30

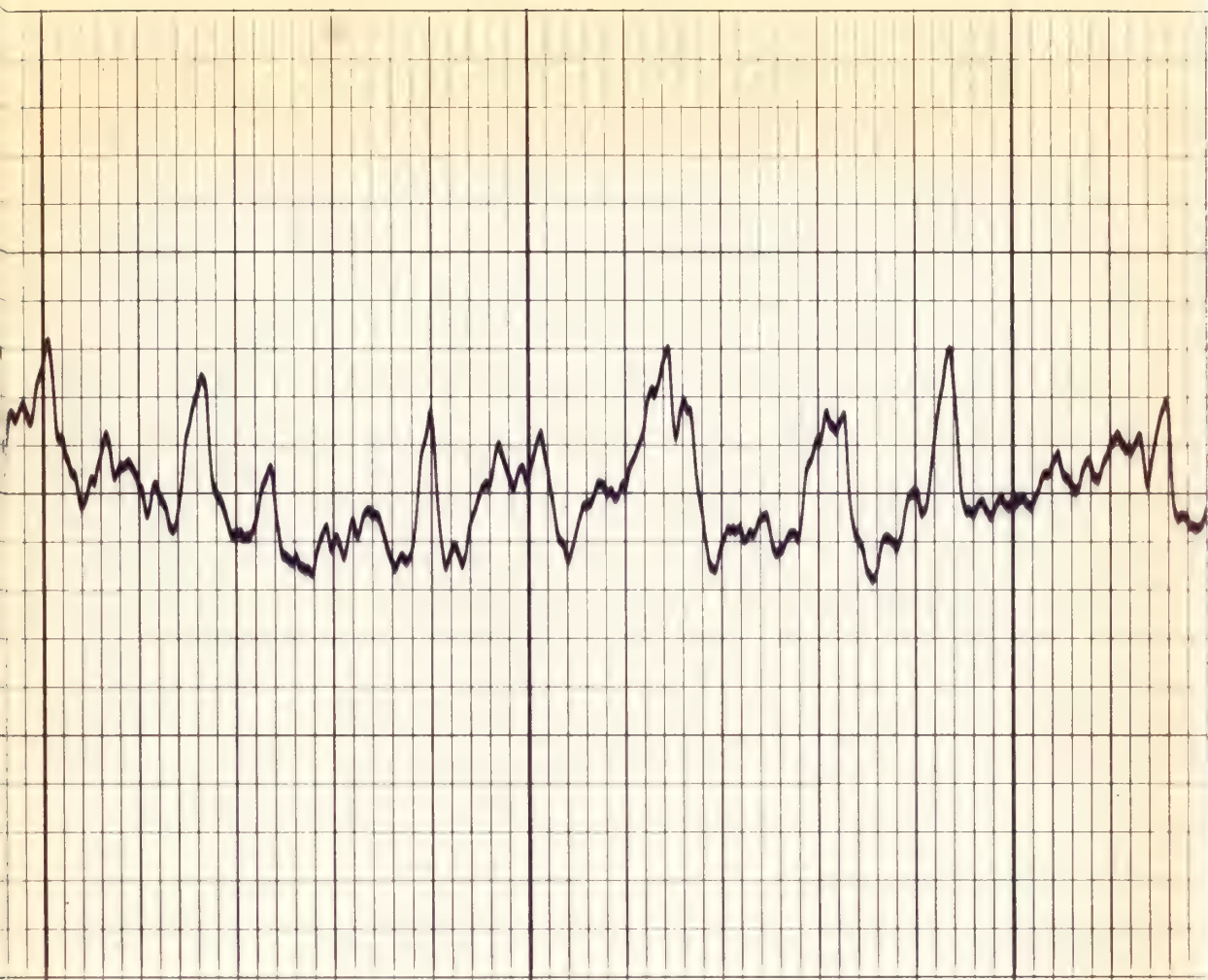
15

0

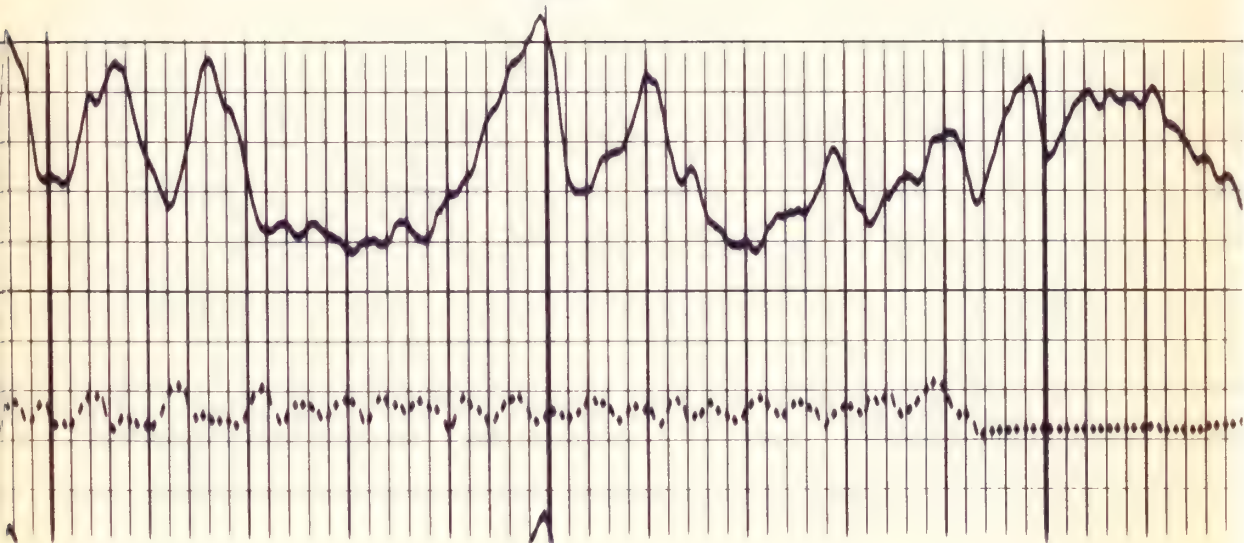
DENSITY POROSITY INDEX %

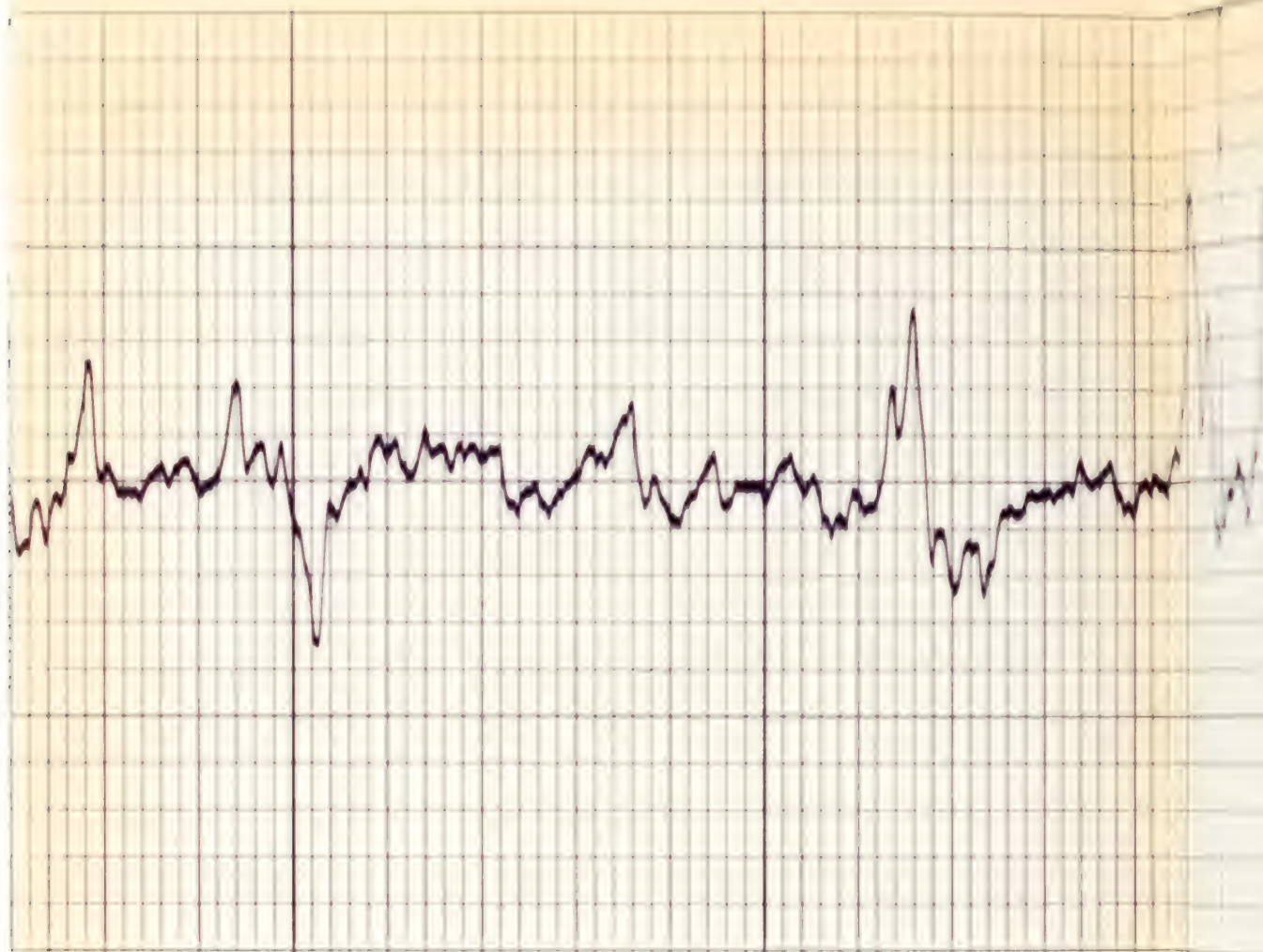
LIMESTONE MATRIX





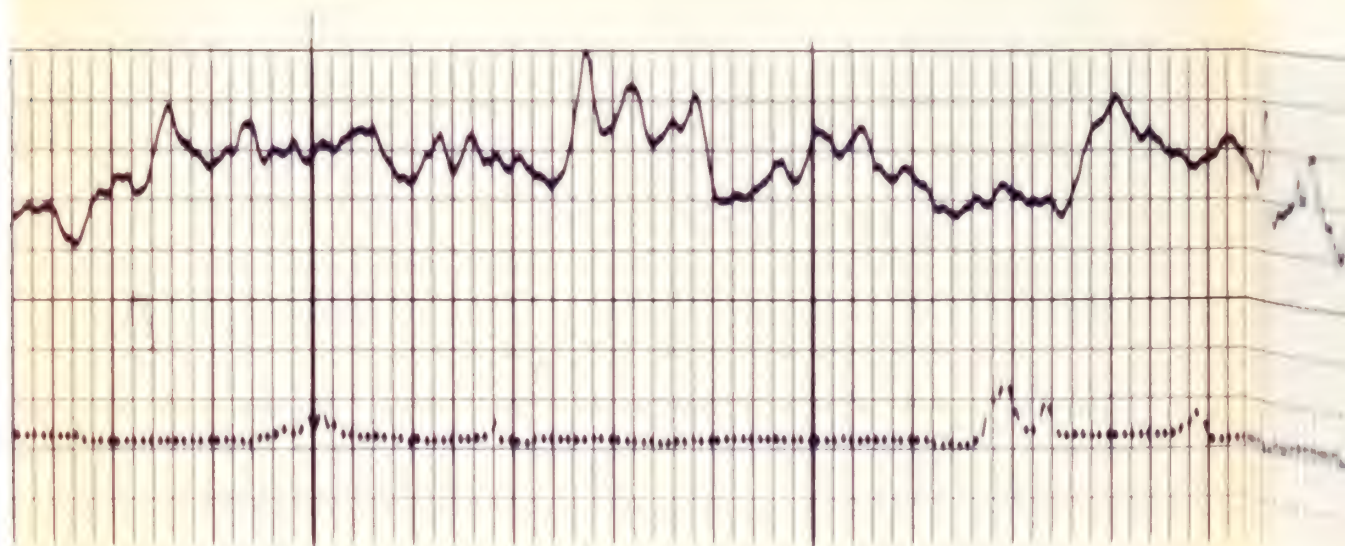
0.250

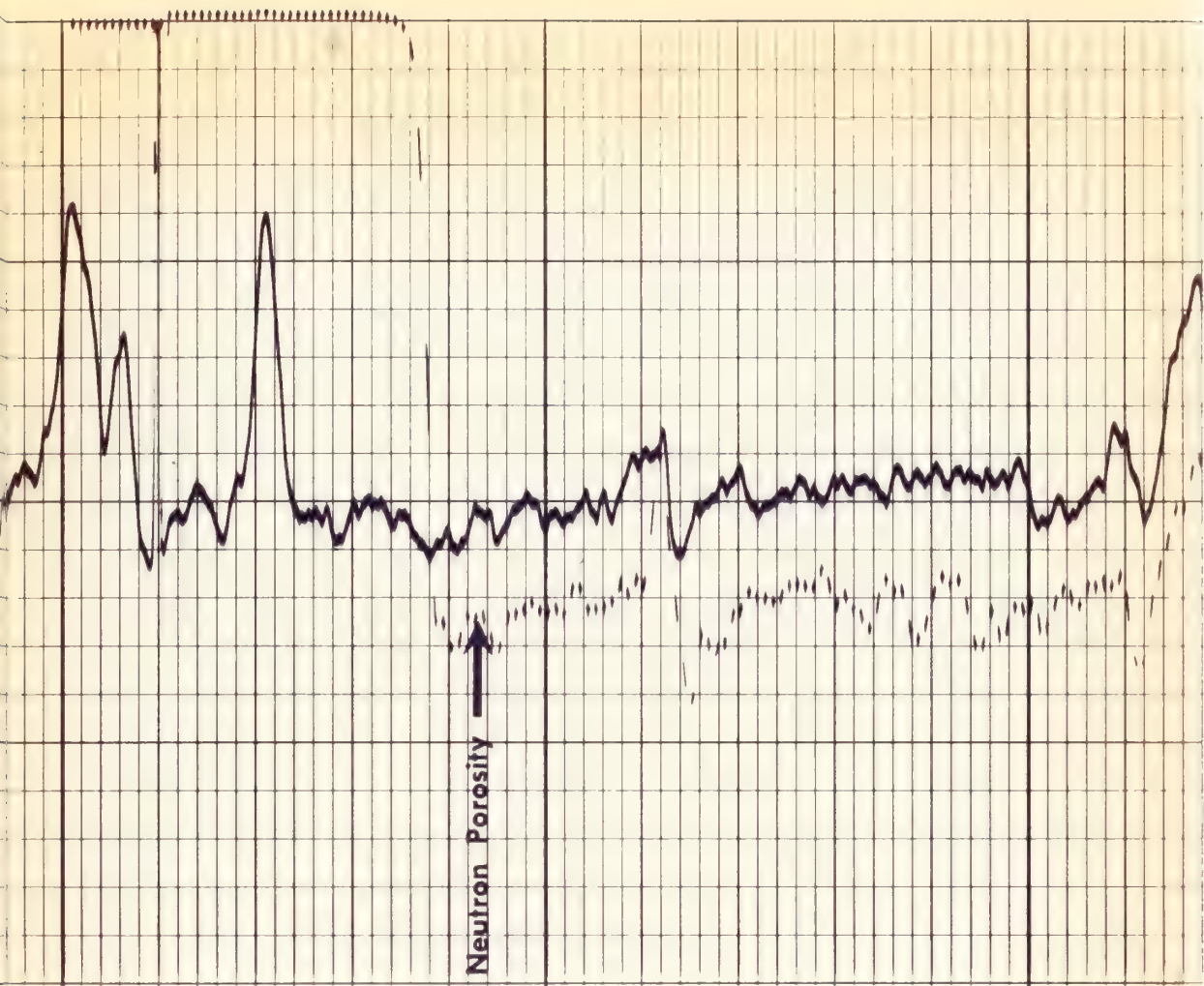




0300

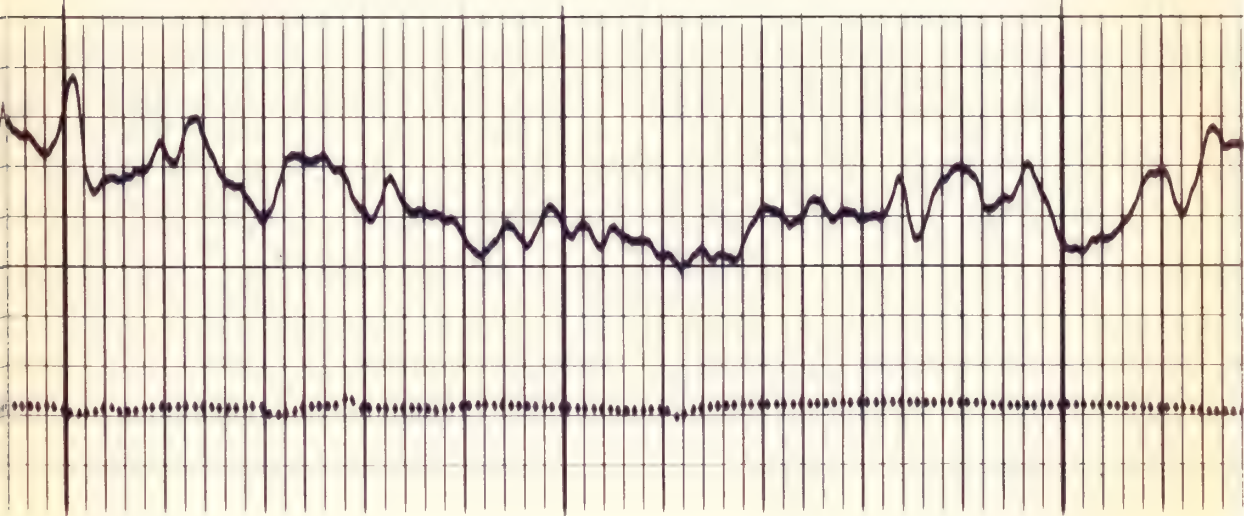
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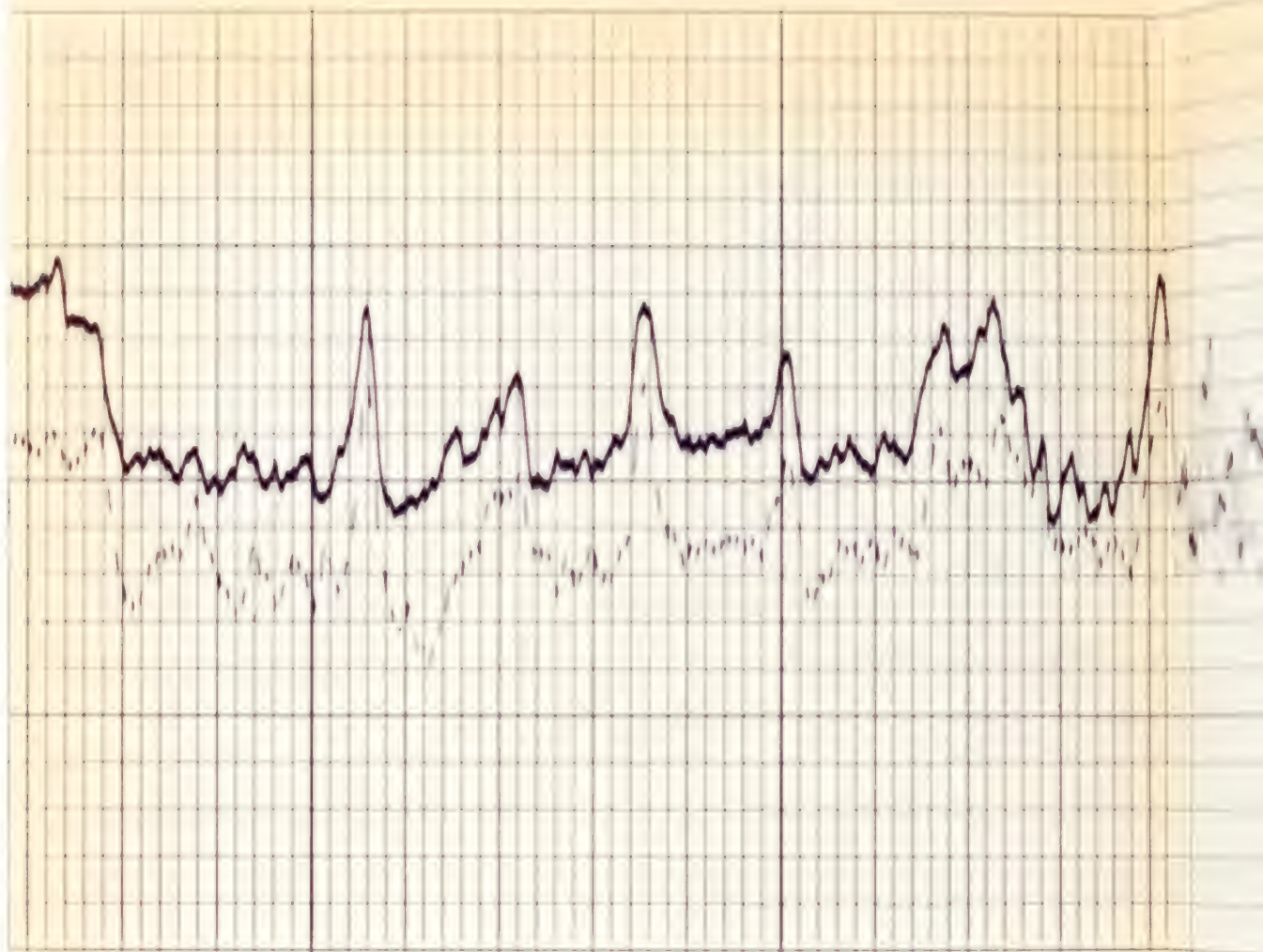




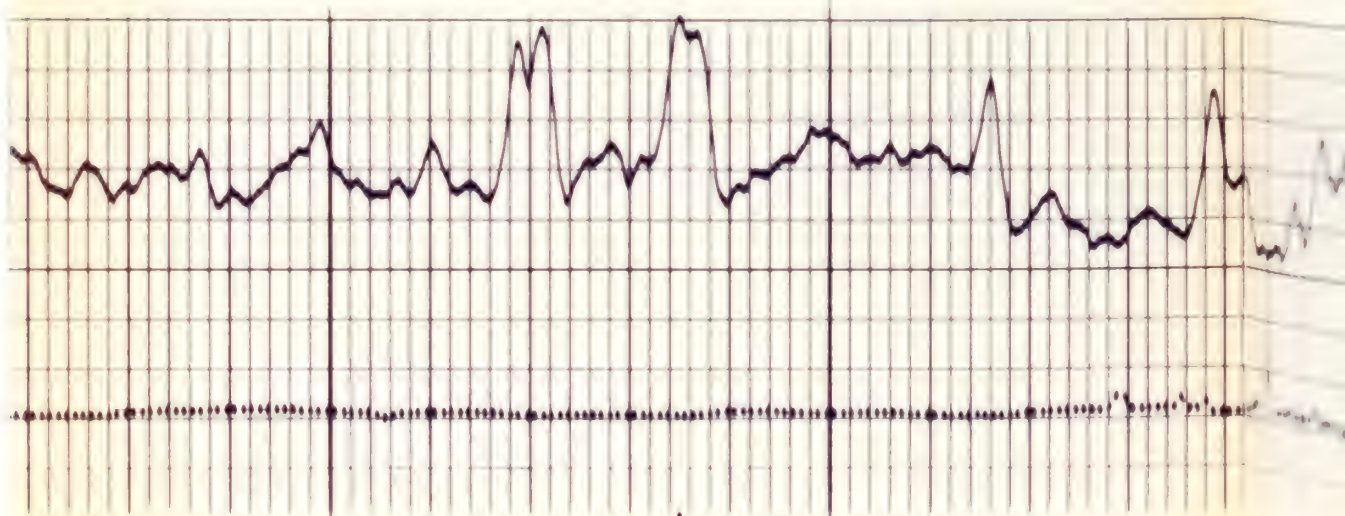
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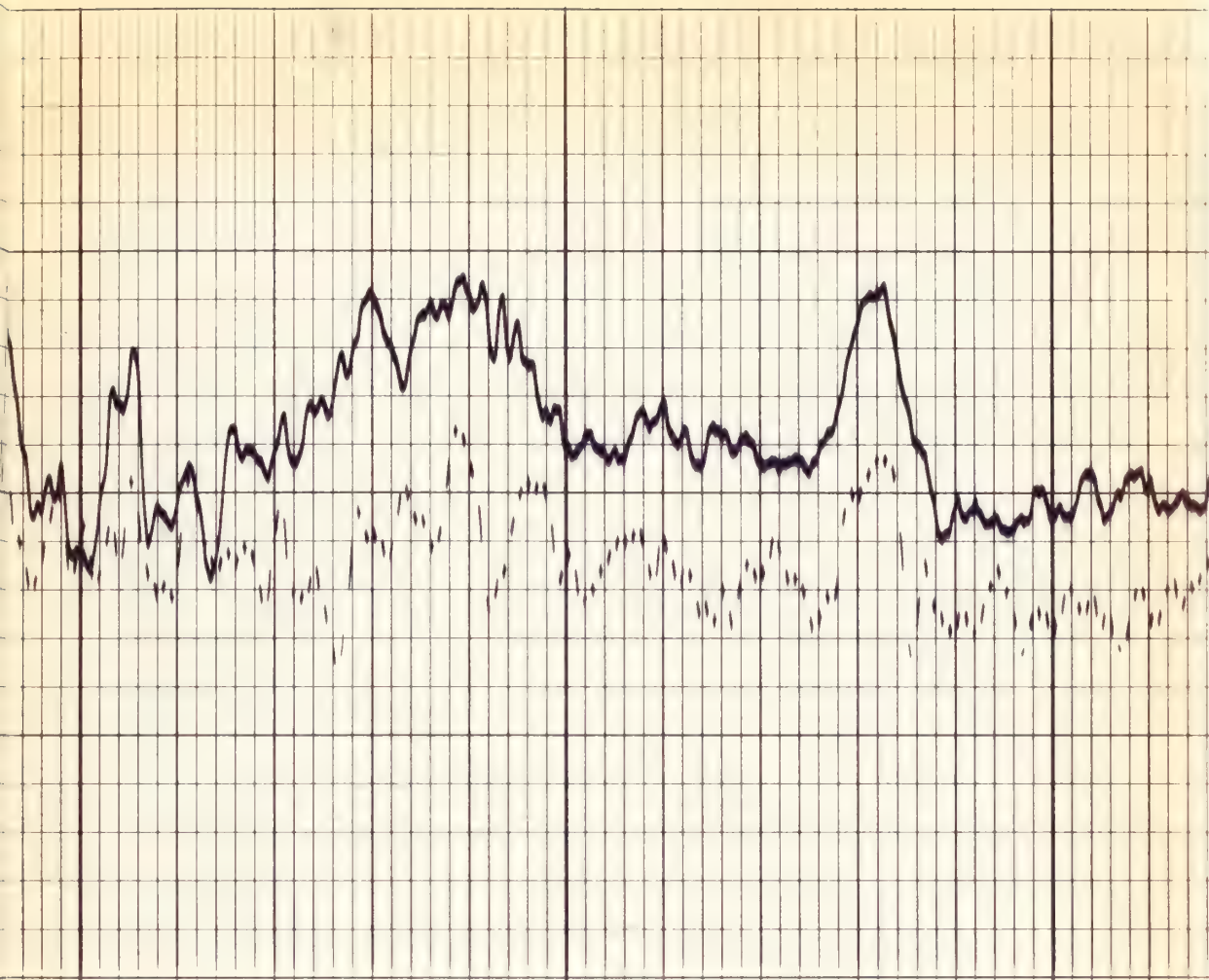
0500



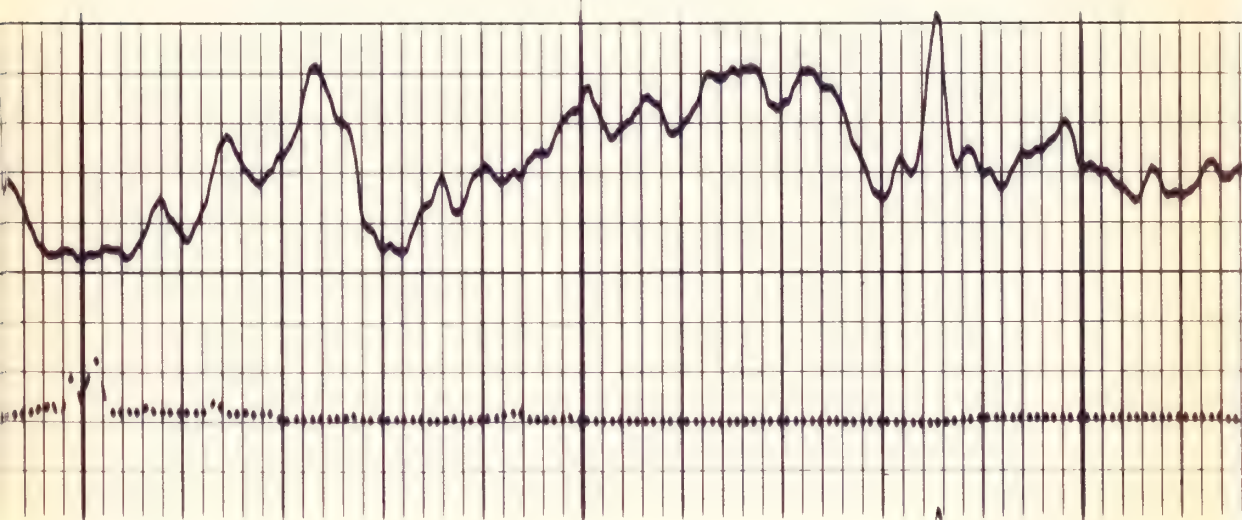


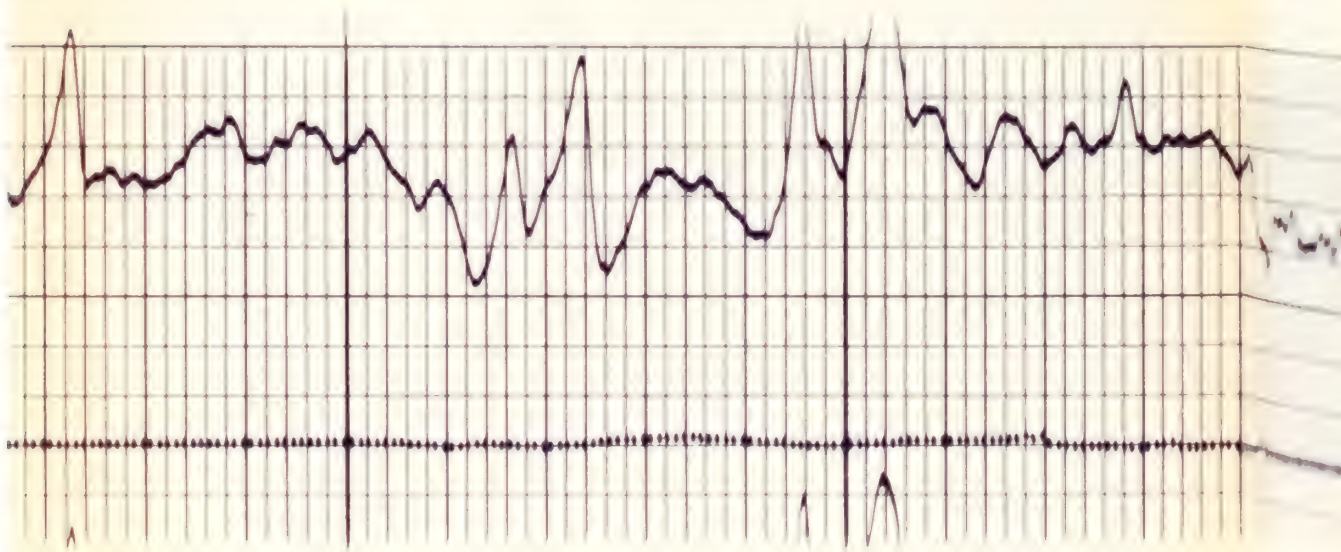
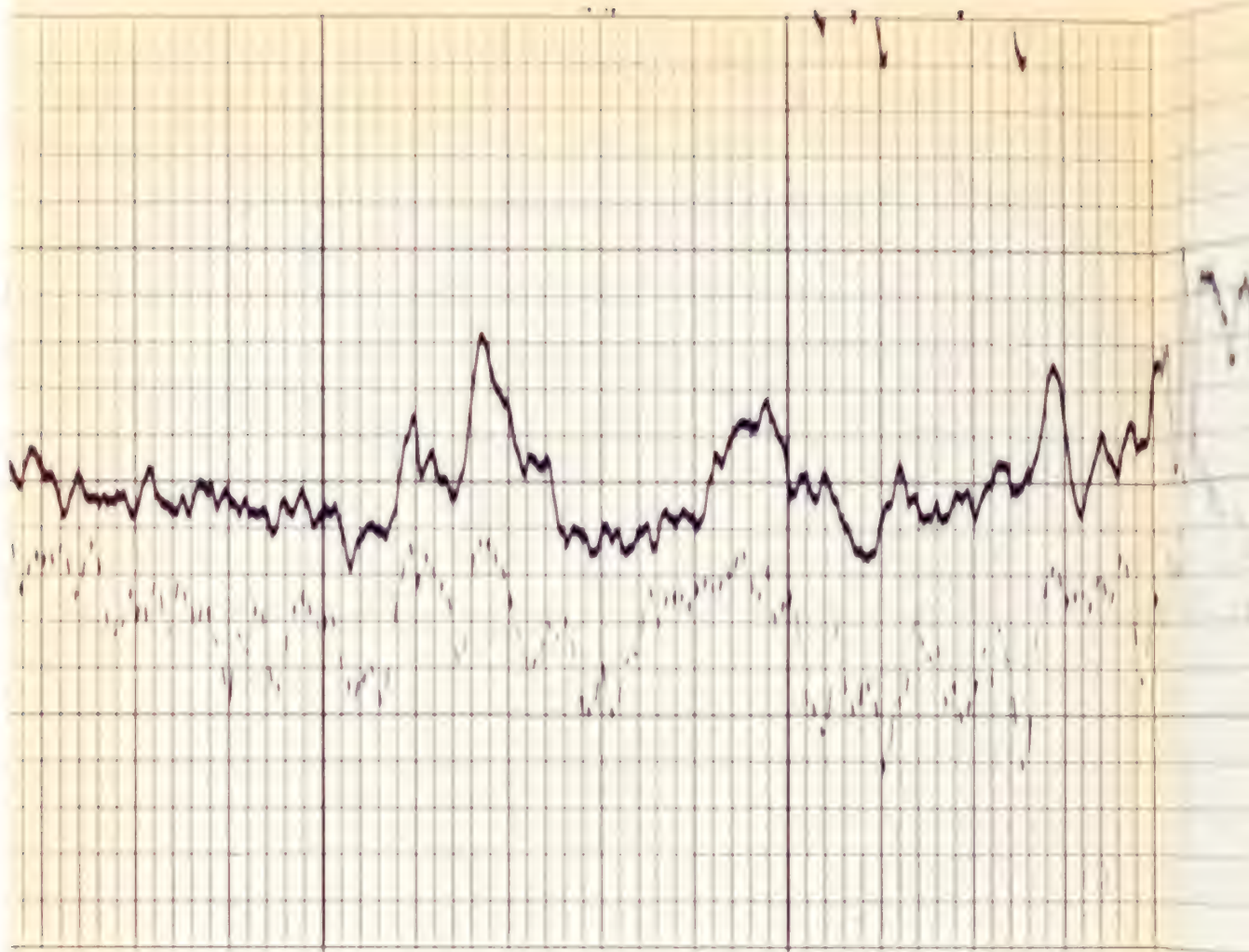
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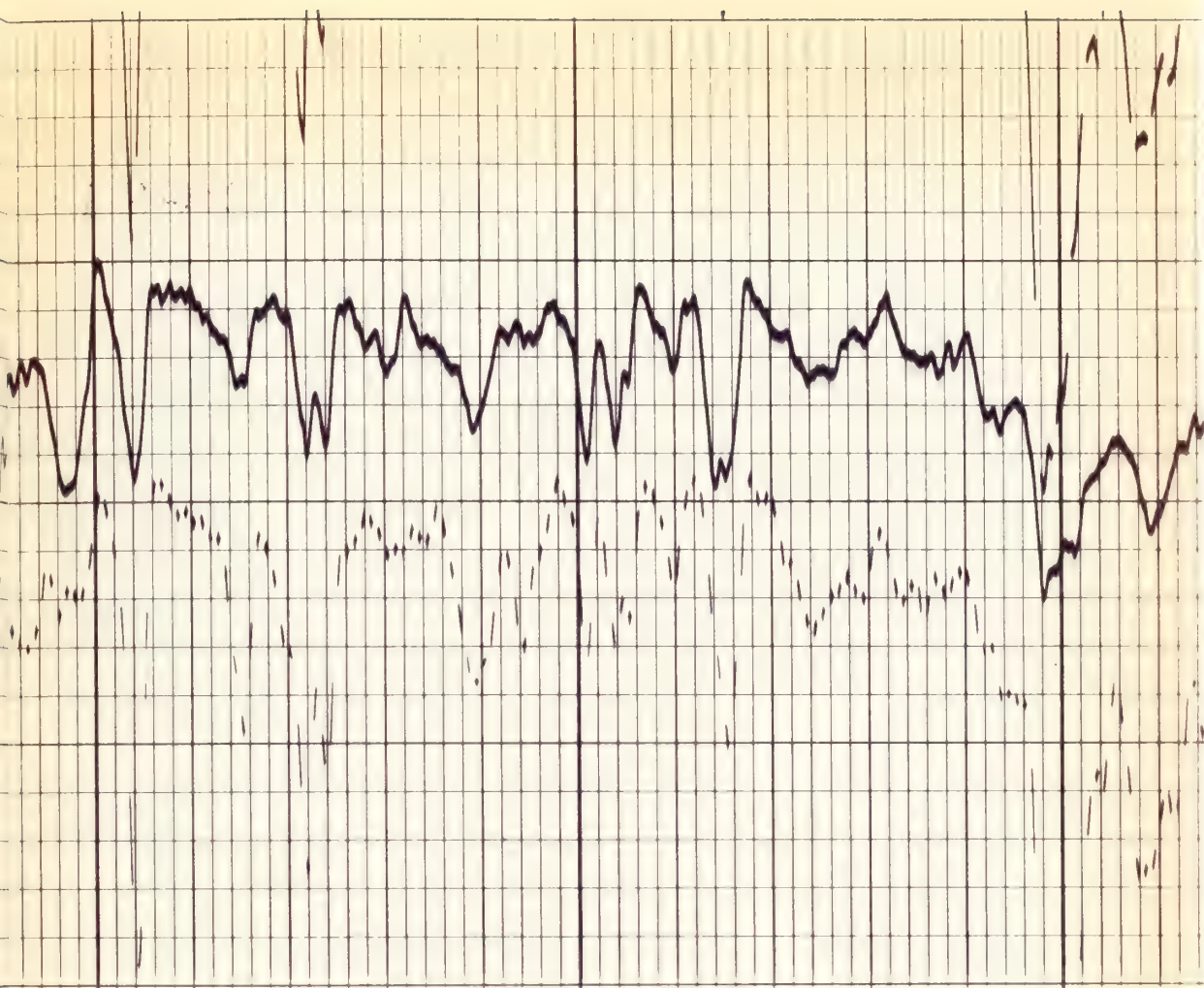




0700

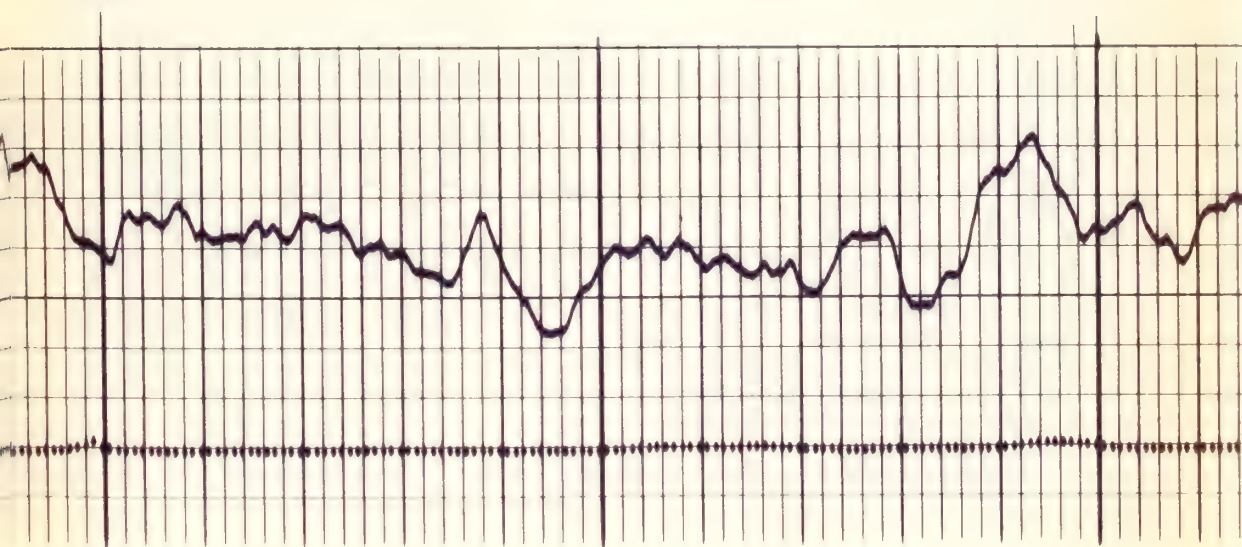


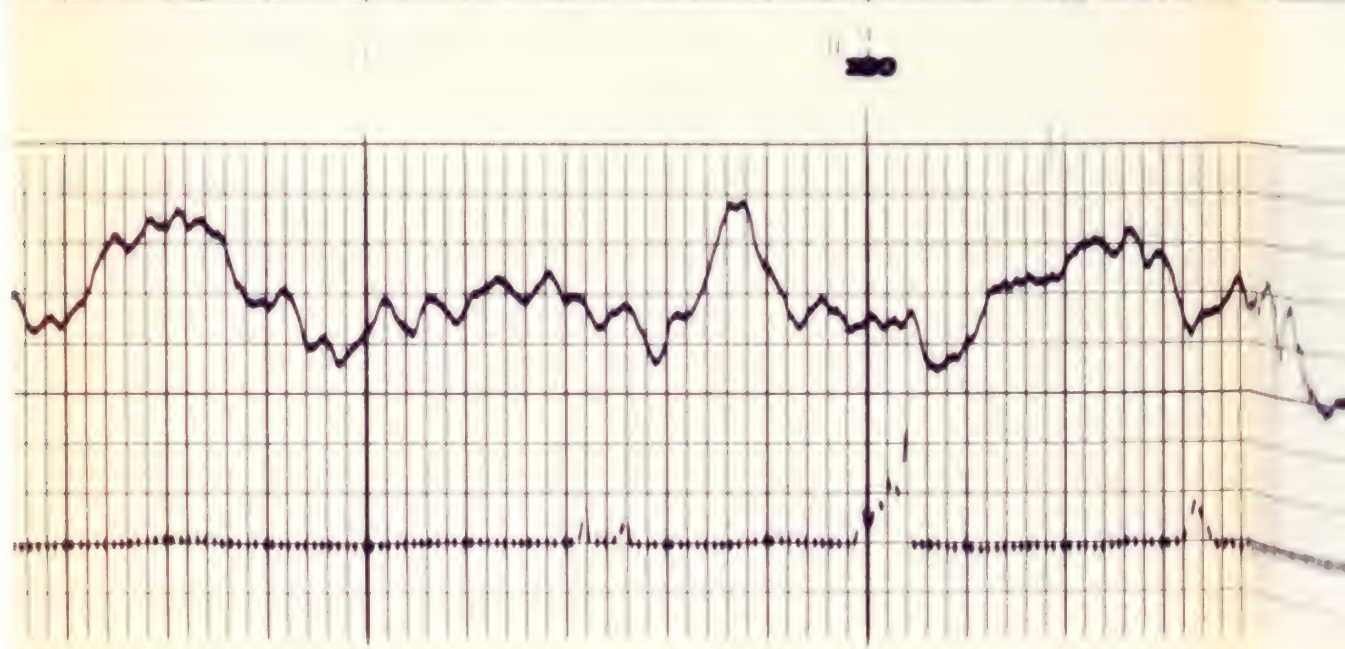
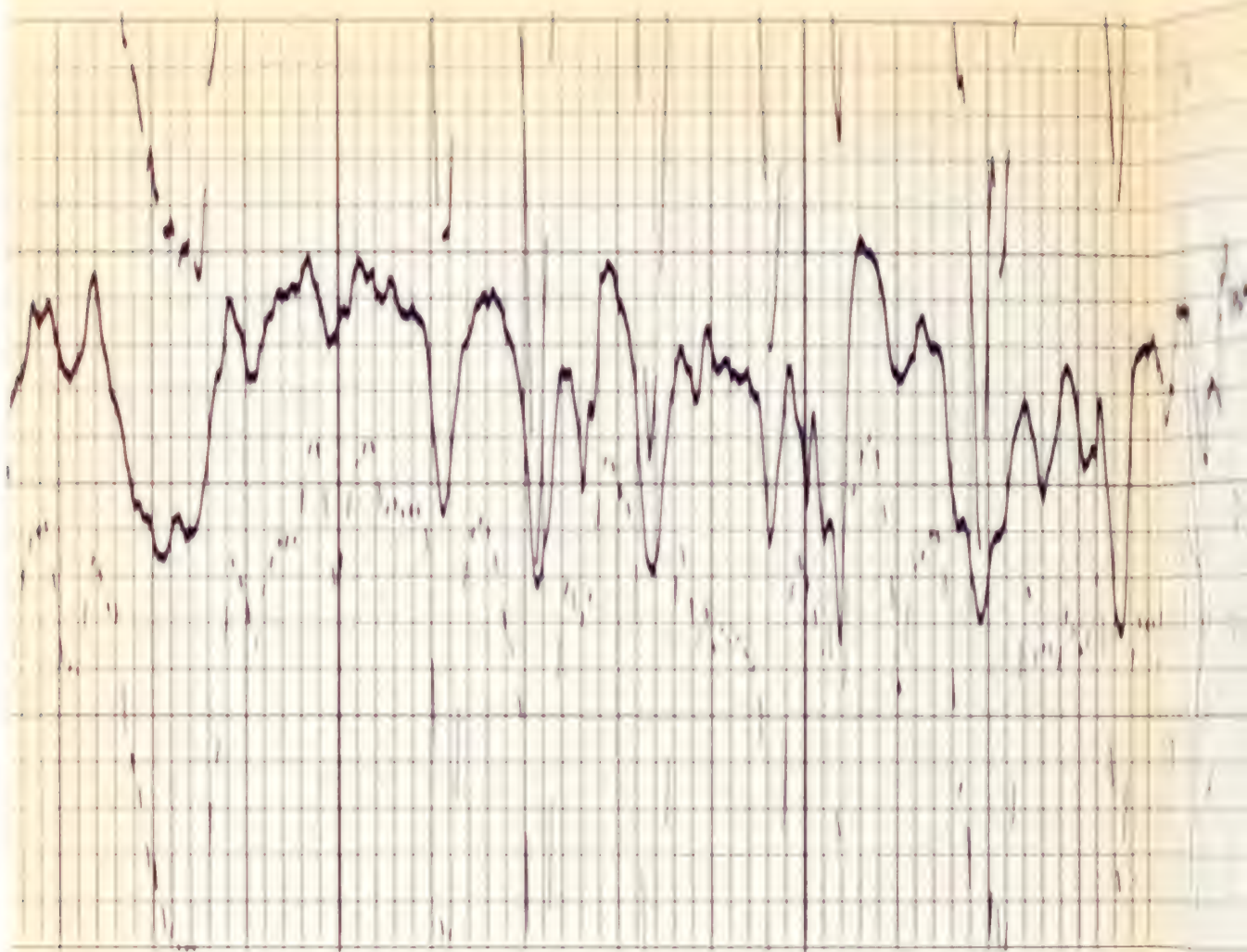


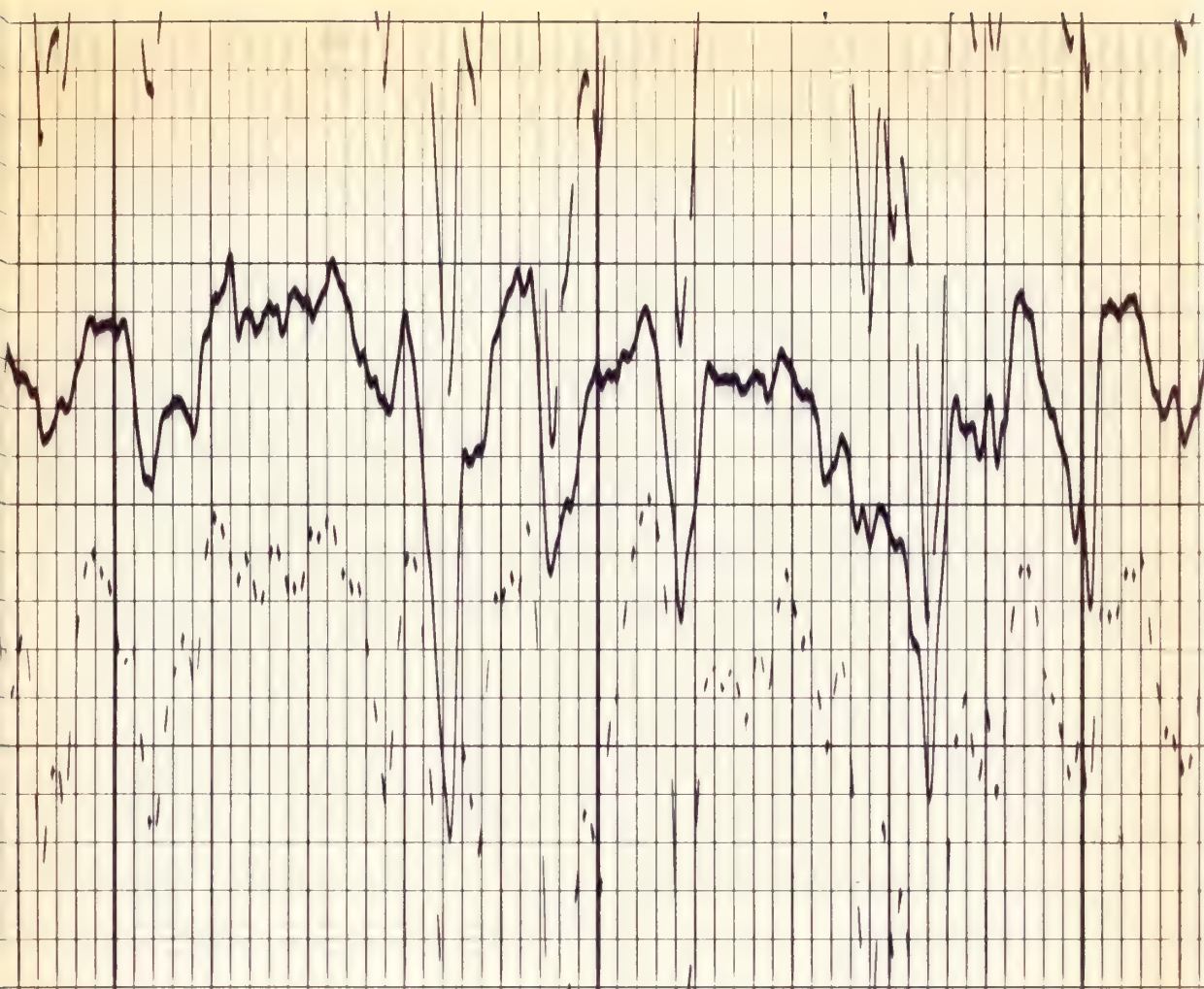


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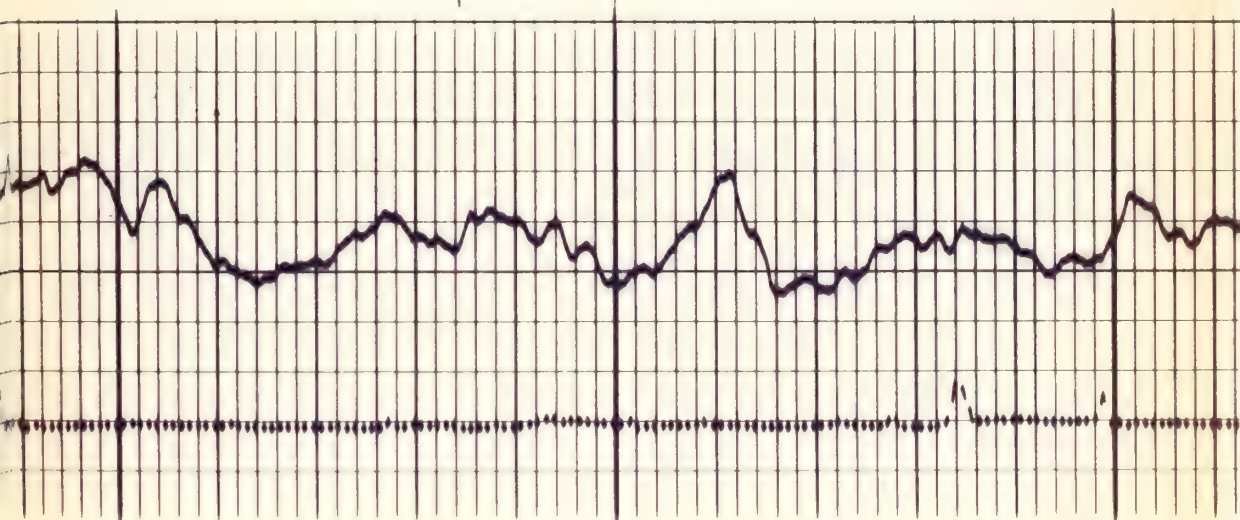
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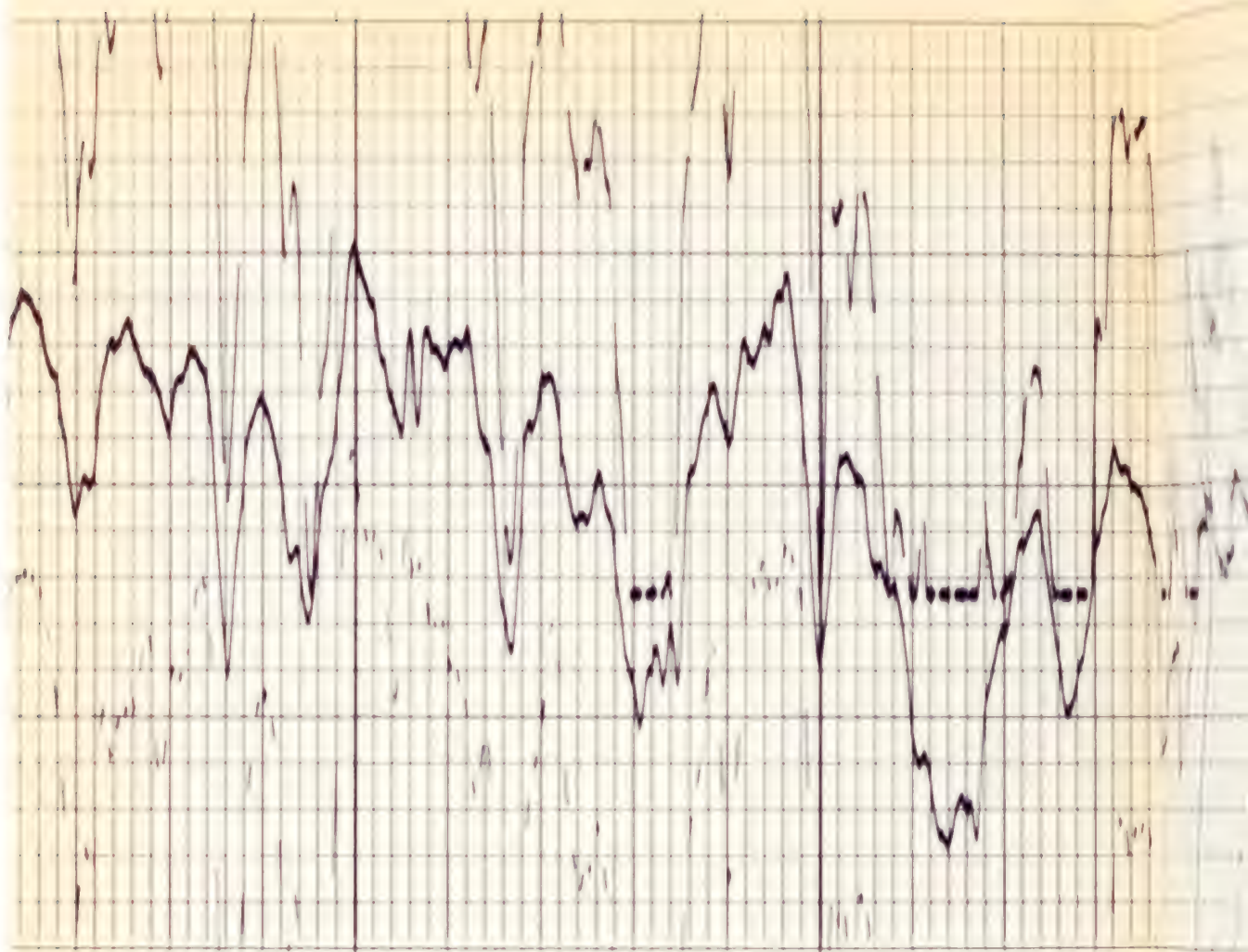




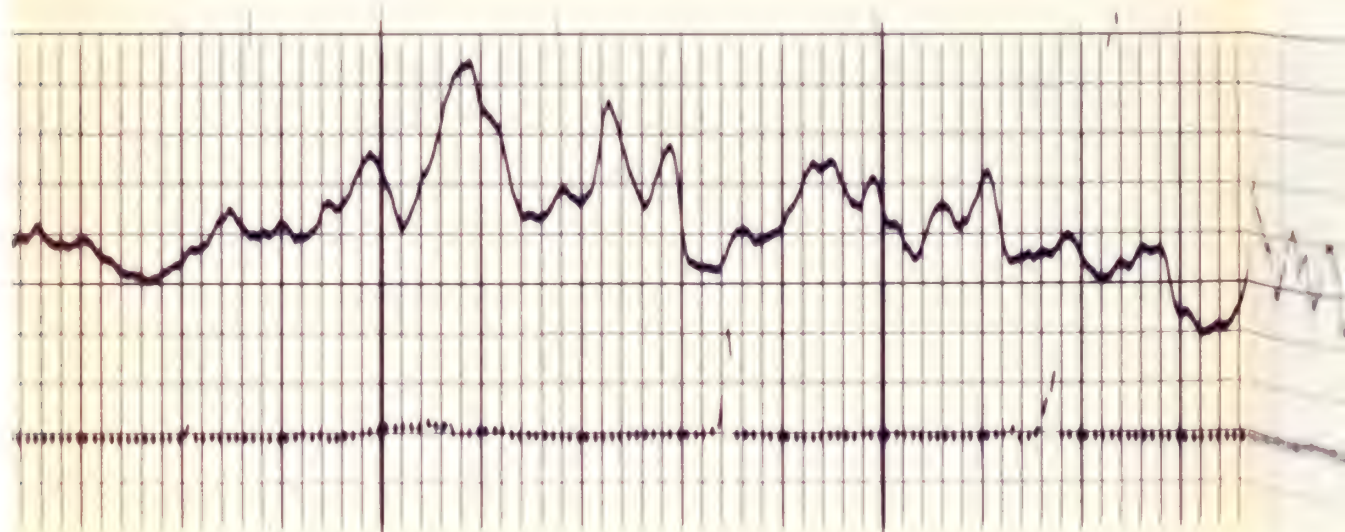


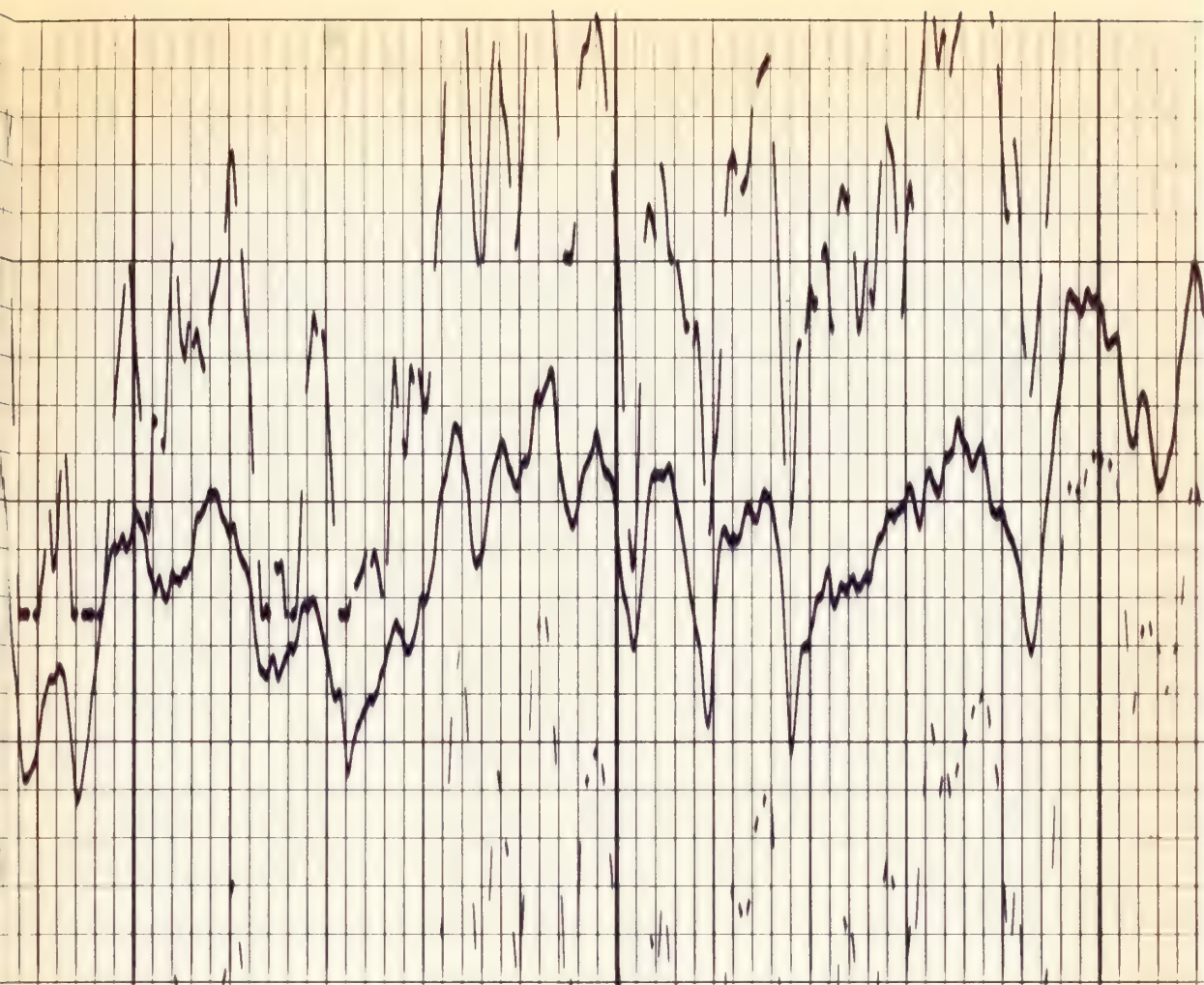
1200





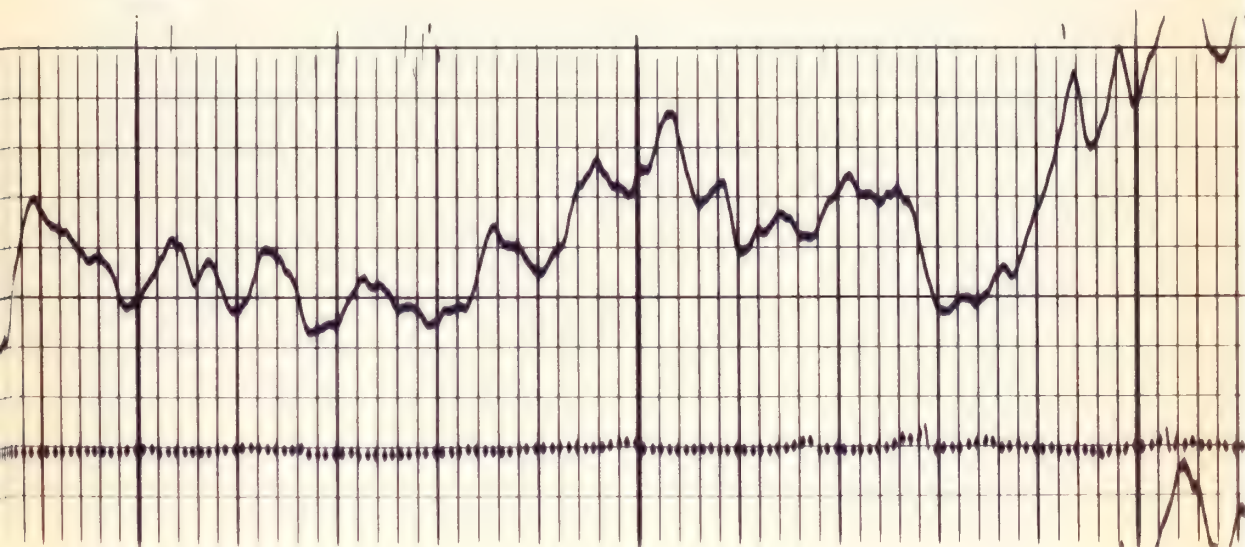
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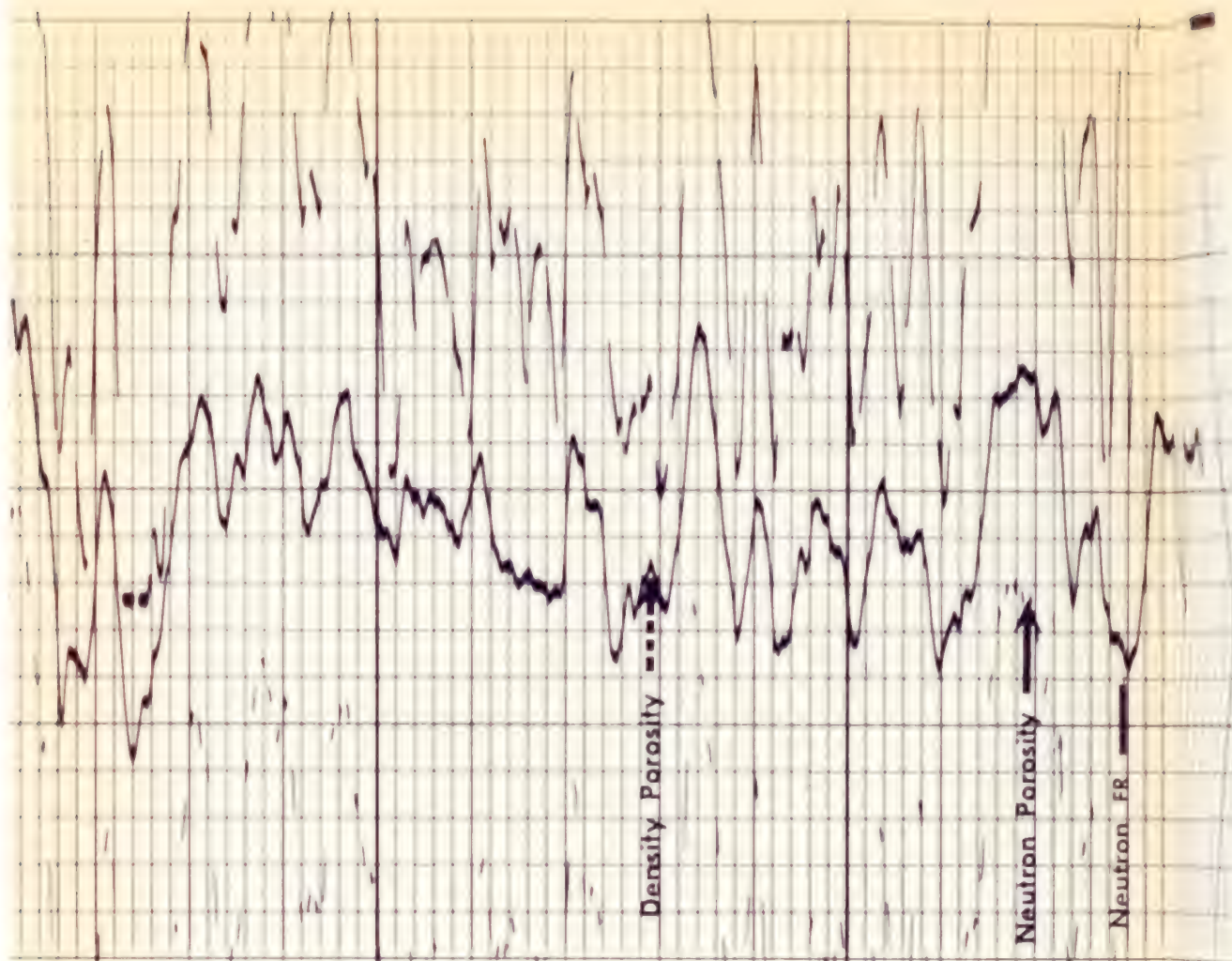




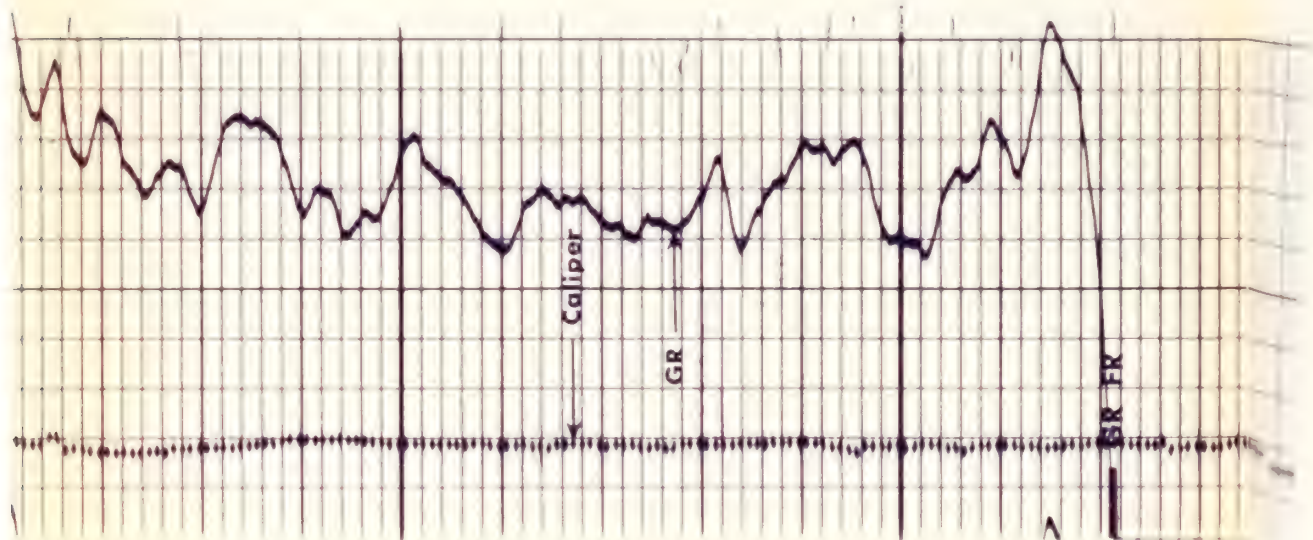
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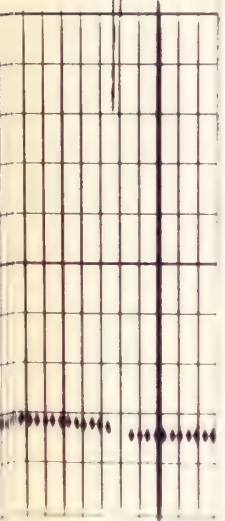
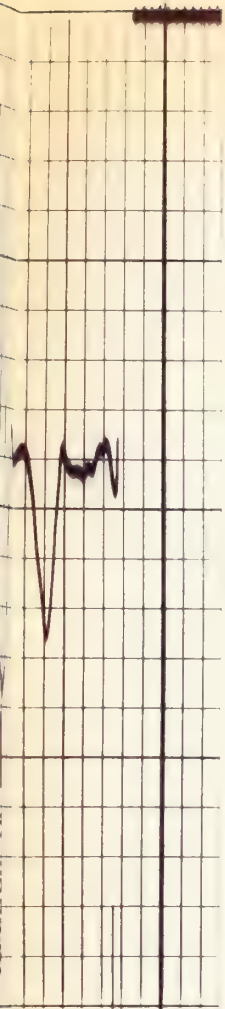
200





500



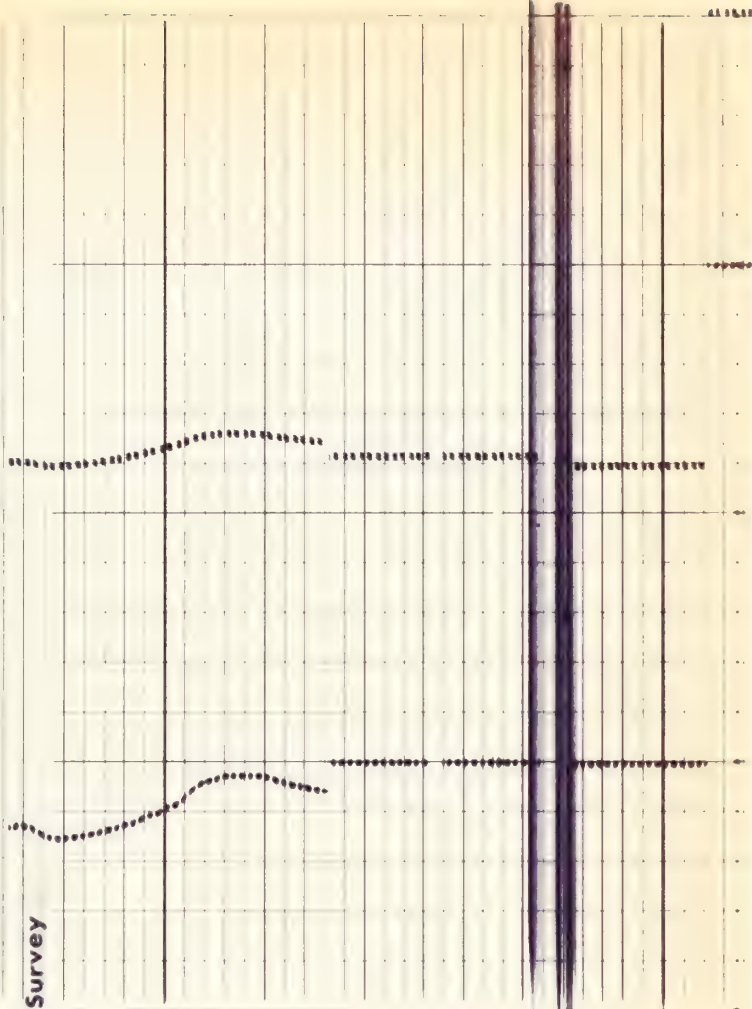


Calibration after Survey

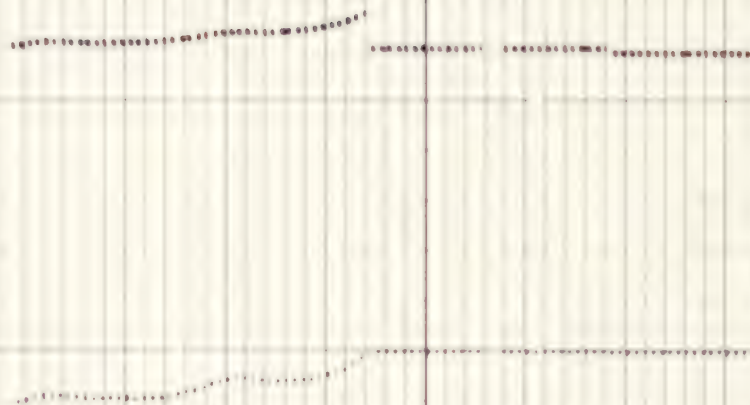
8

7

2



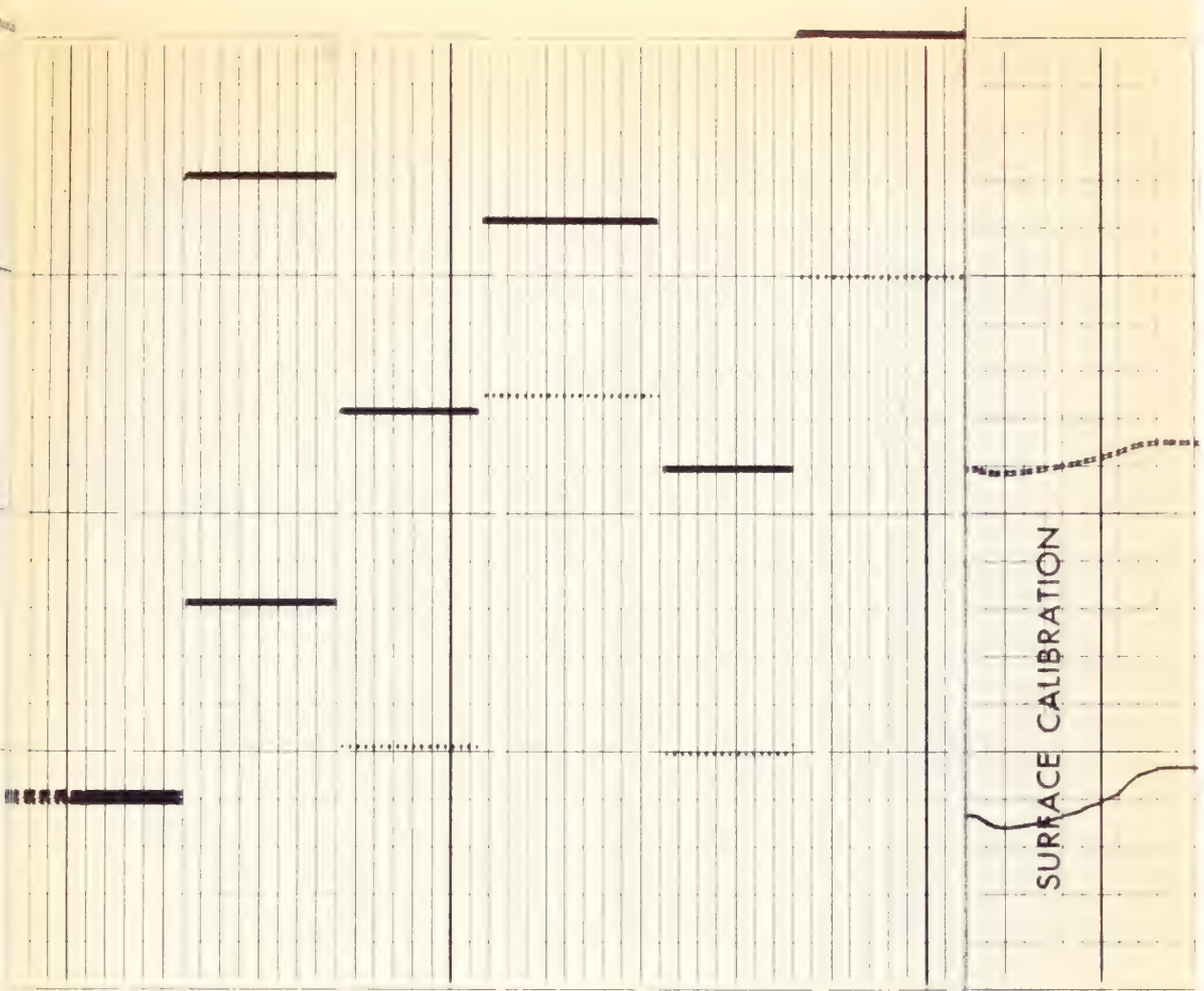
Calibration before Survey



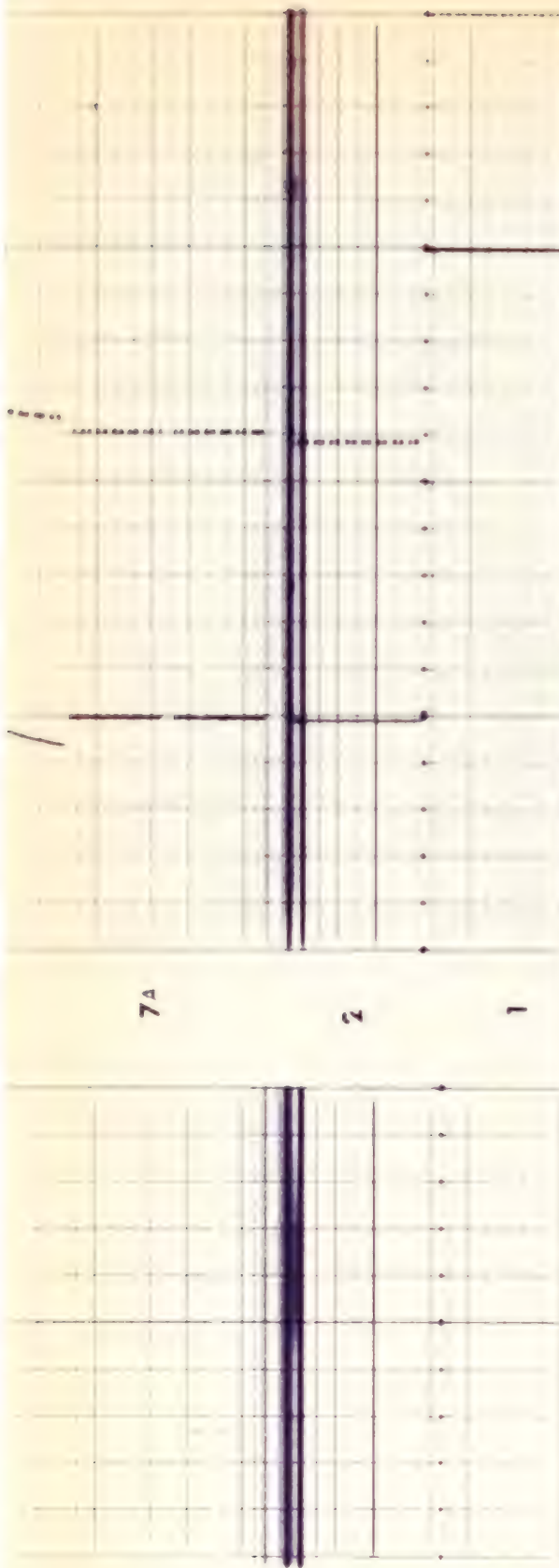
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8

7

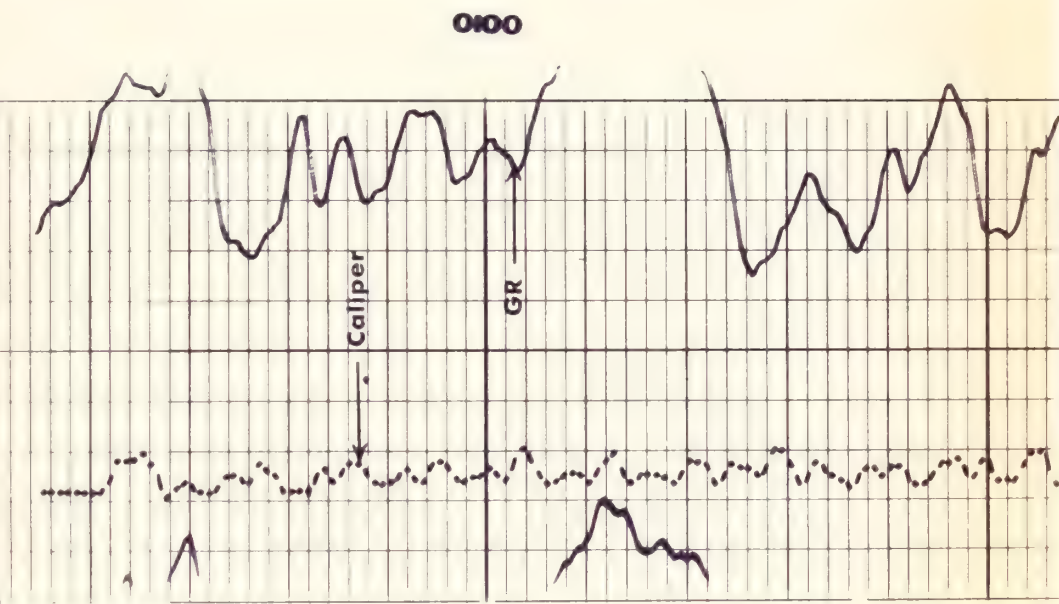
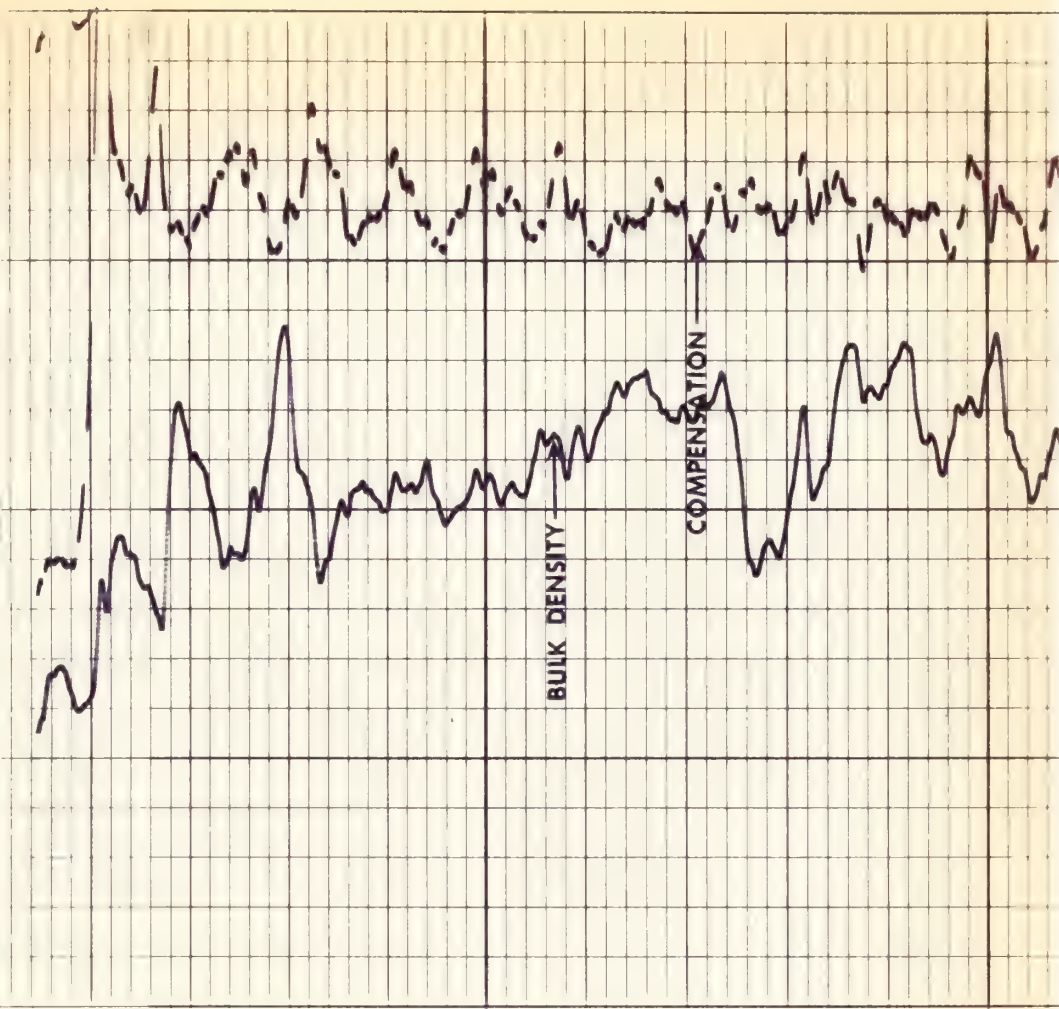


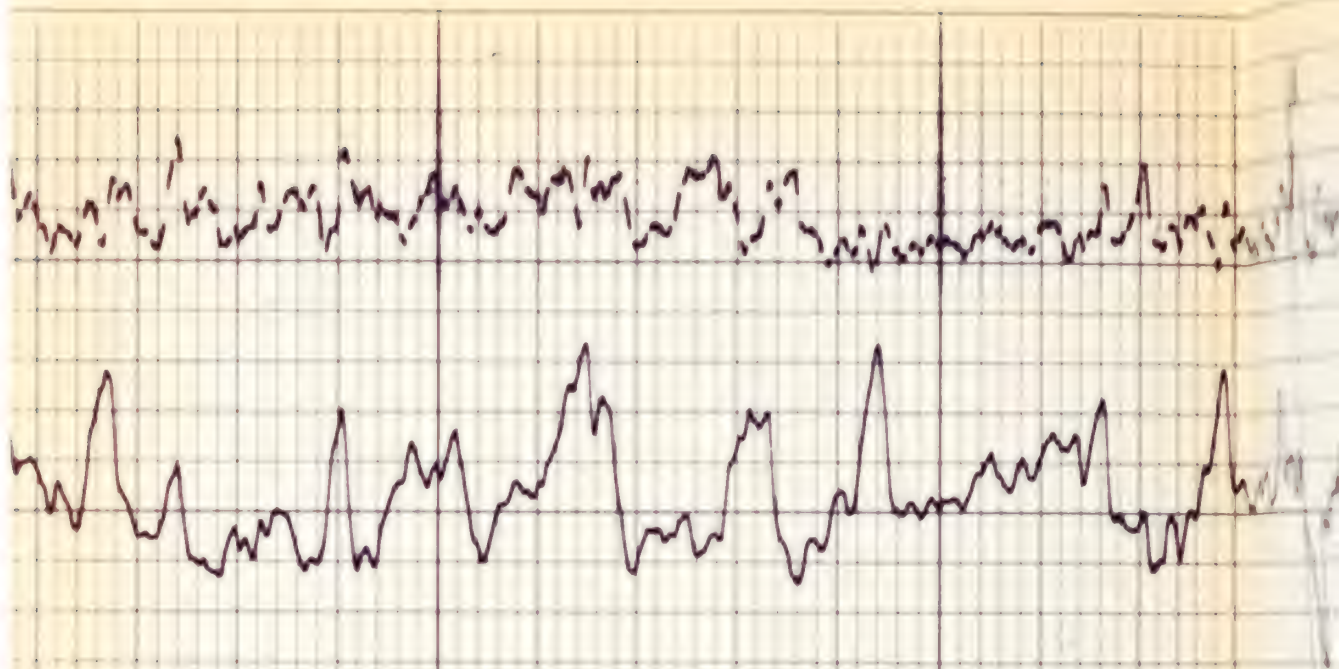
6
5
4
3
2
1
8A



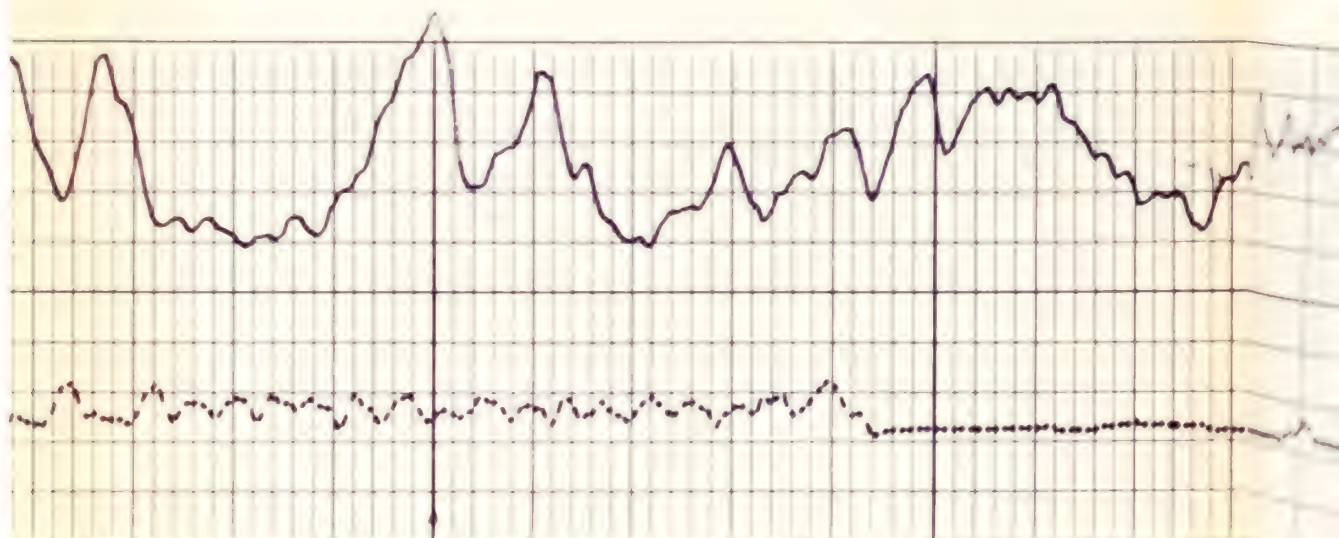
DETAIL LOG 5" = 100'

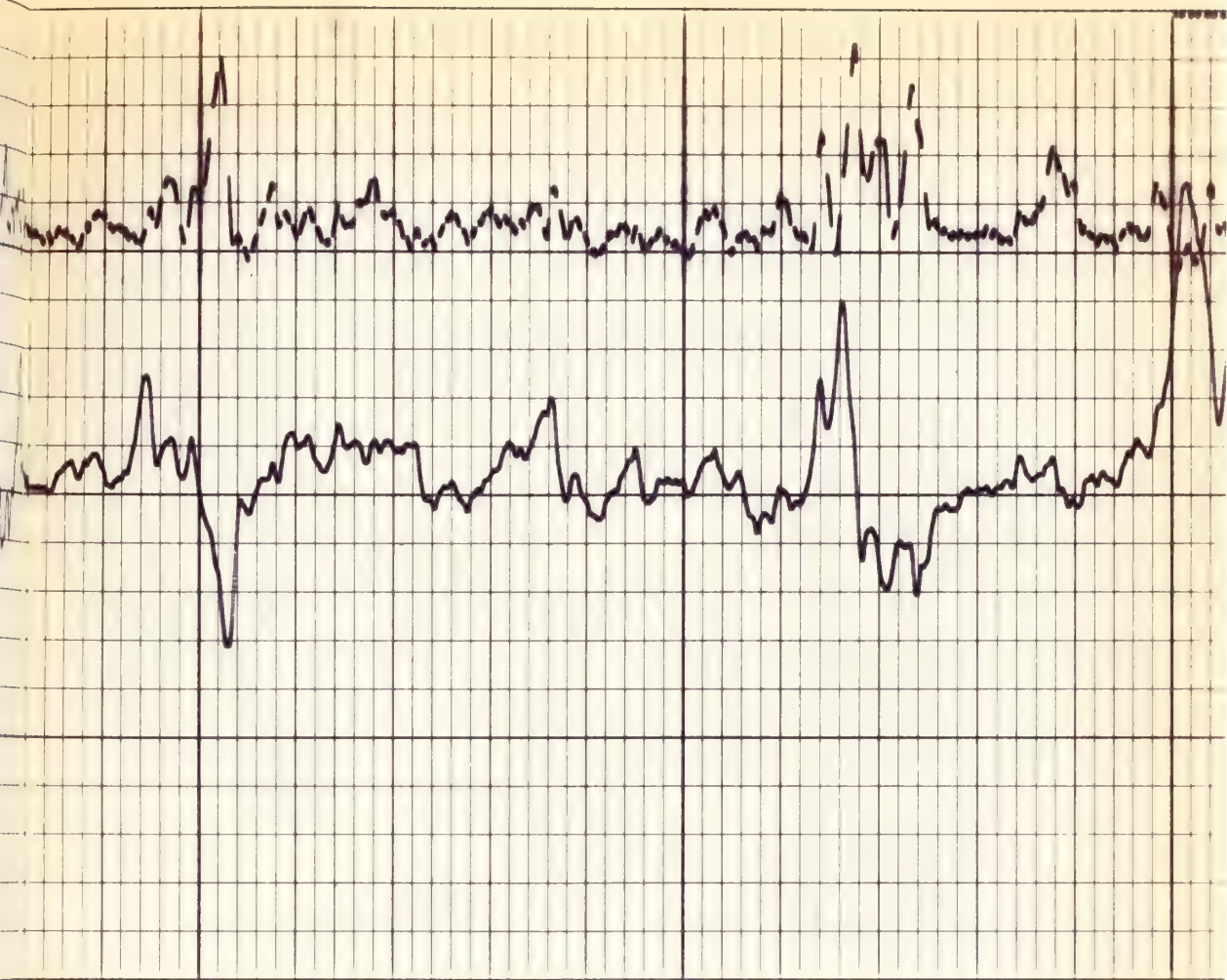
| | | | | | |
|--|---------------|-----------------------------------|---|---------------------------------------|---|
| <p>CALIPER HOLE DIAM. IN INCHES</p> <p>6.0 16.0</p> | <p>DEPTHS</p> | <p>CNL RATIO</p> <p>5.0 2.5 0</p> | <p>CORRECTION GRAMS CC</p> <p>-25 0 +25</p> | <p>GAMMA RAY API UNITS</p> | <p>BULK DENSITY GRAMS CC</p> |
|--|---------------|-----------------------------------|---|---------------------------------------|---|





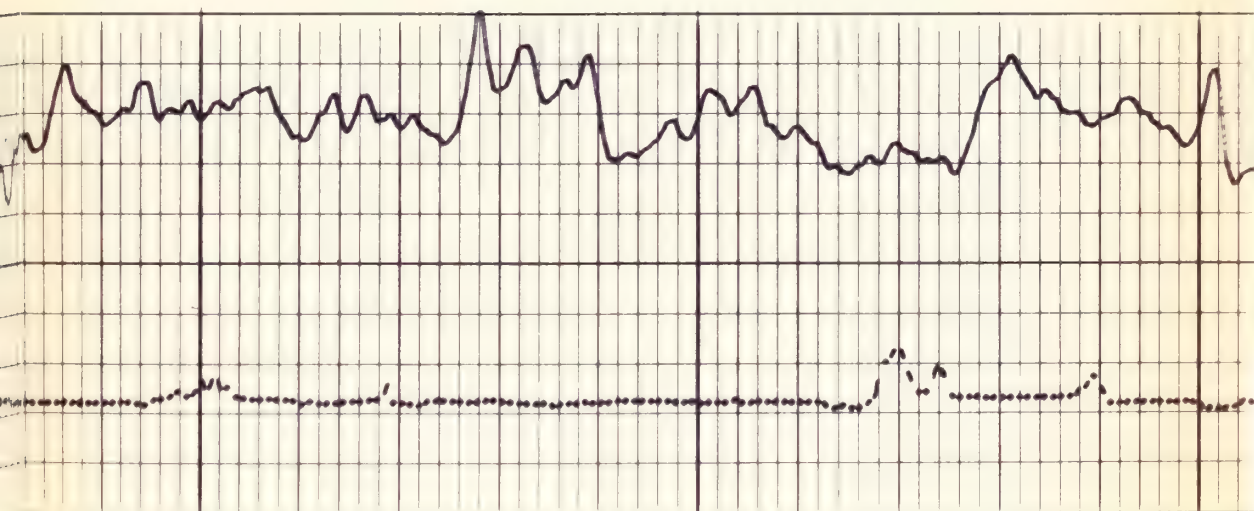
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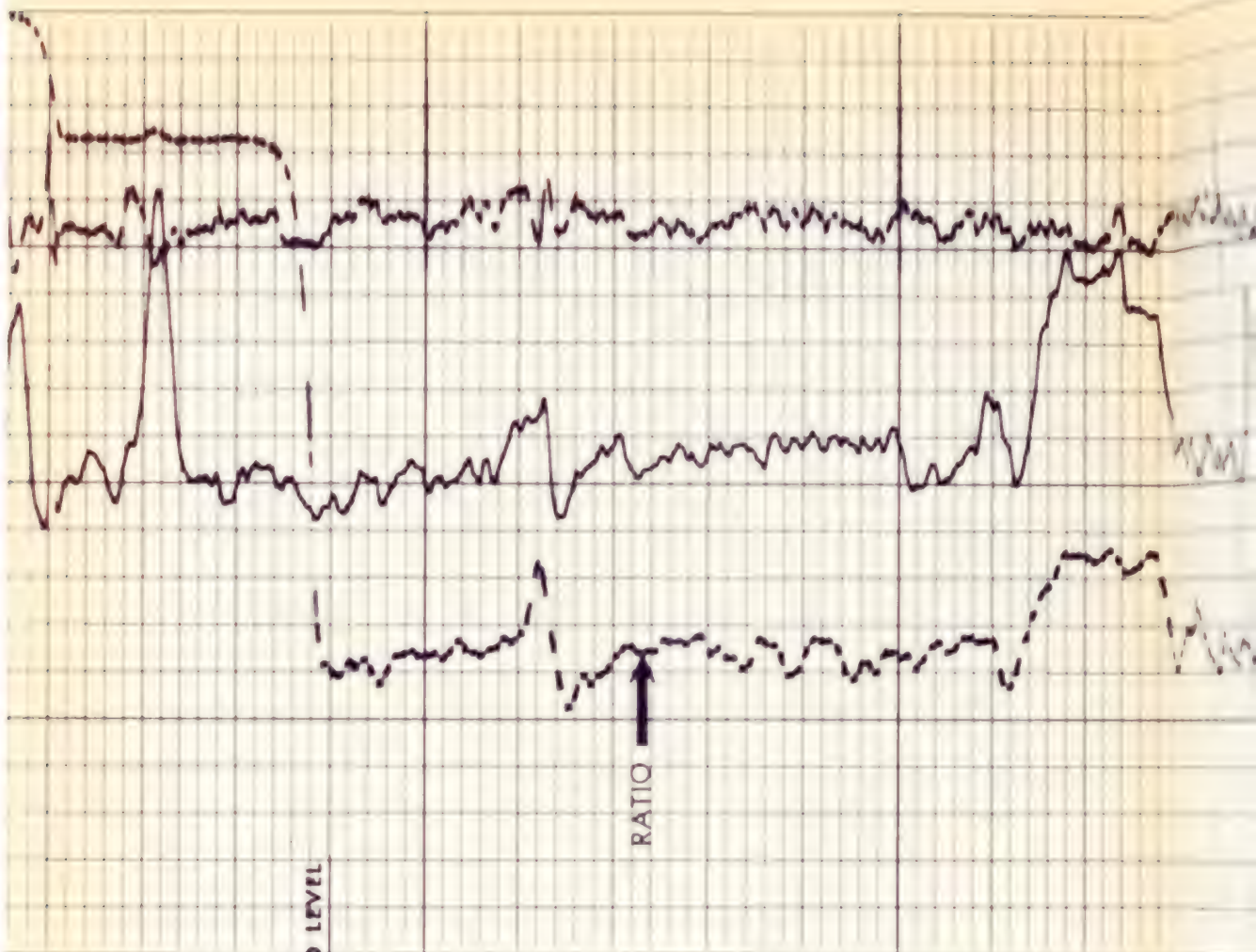




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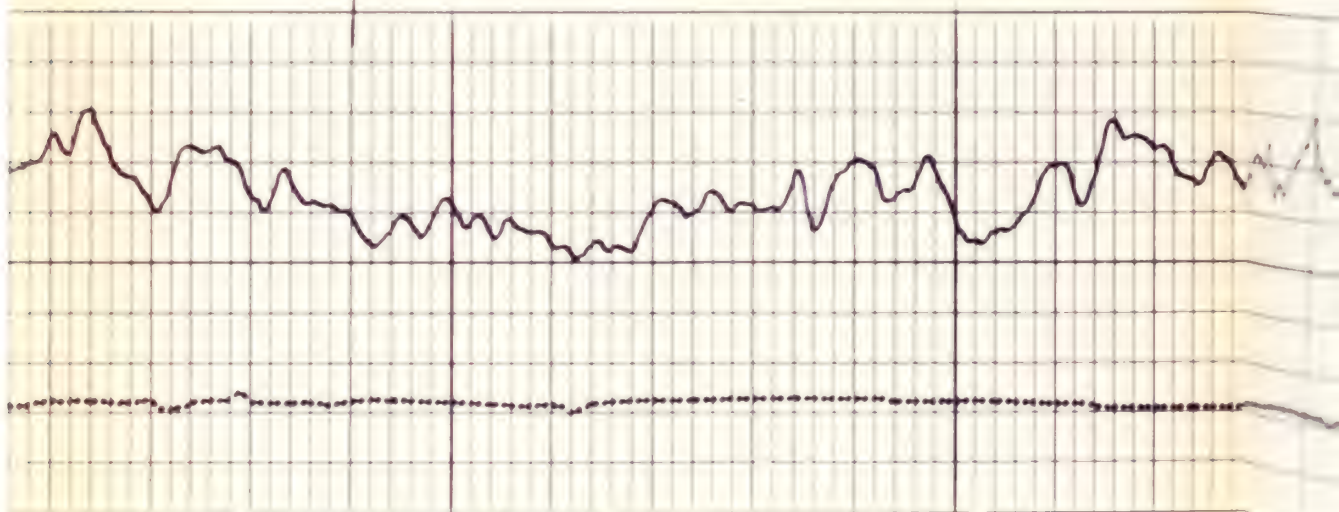
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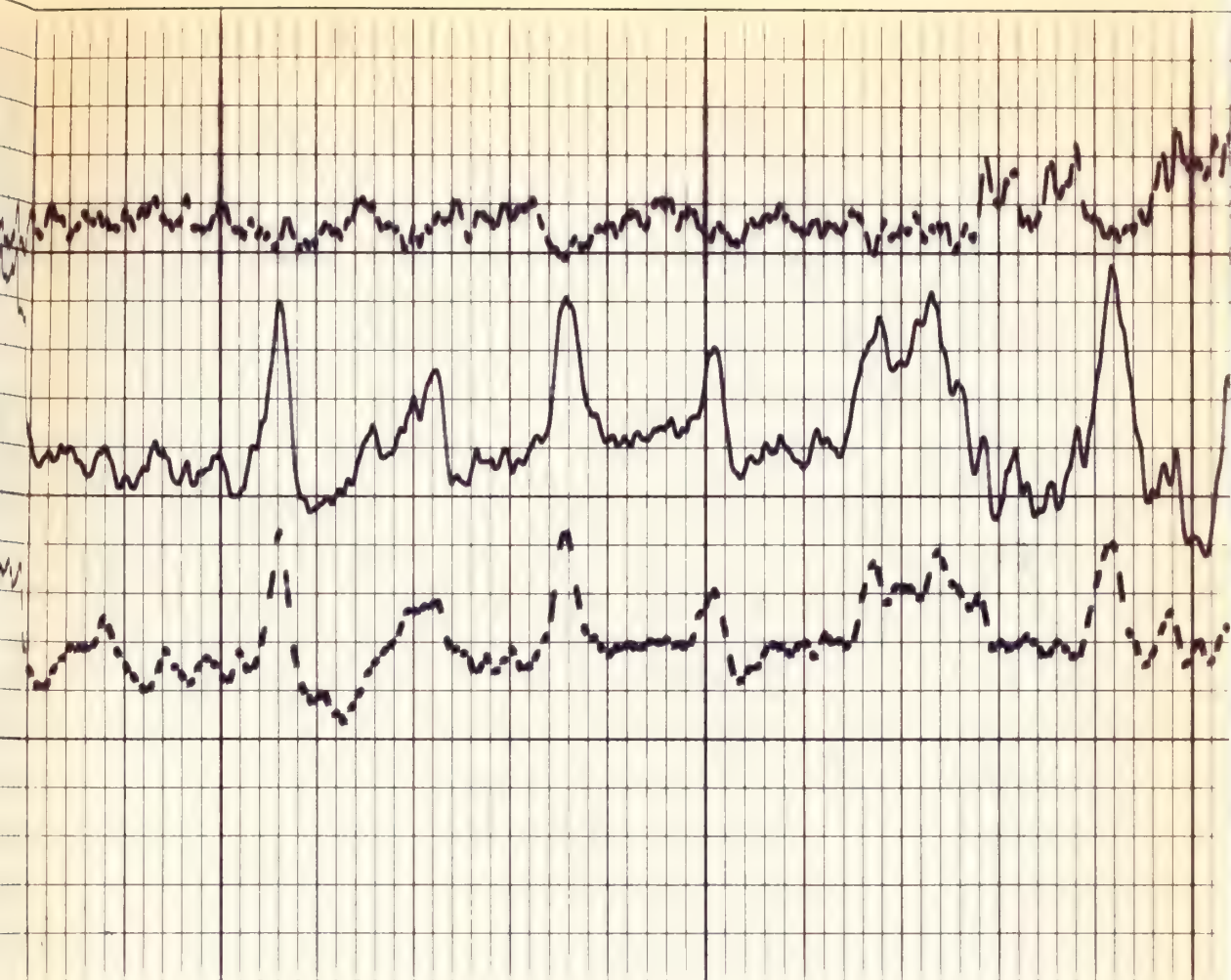




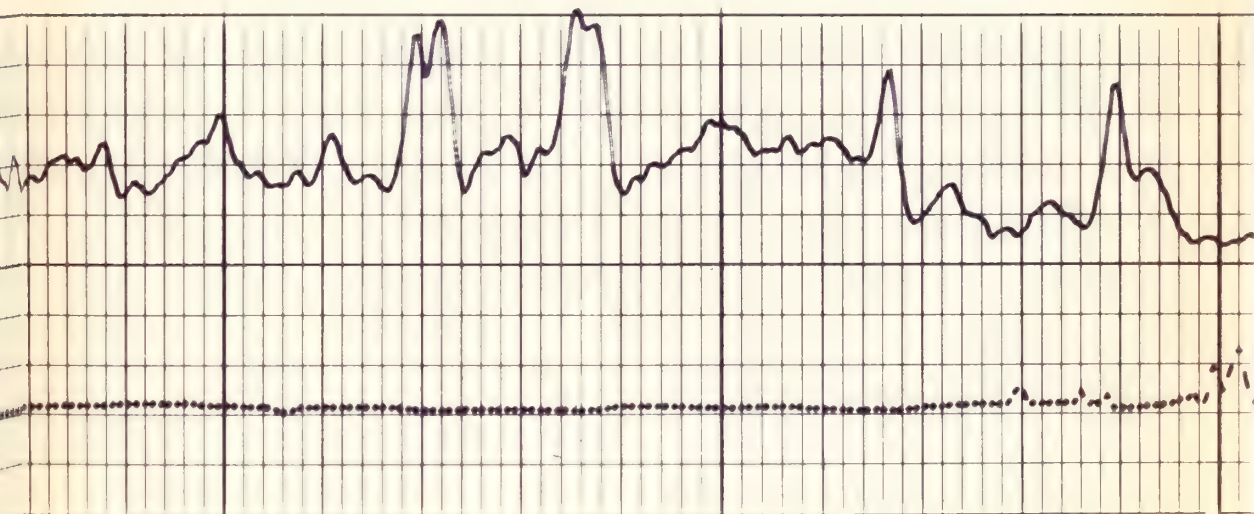
FLUID LEVEL

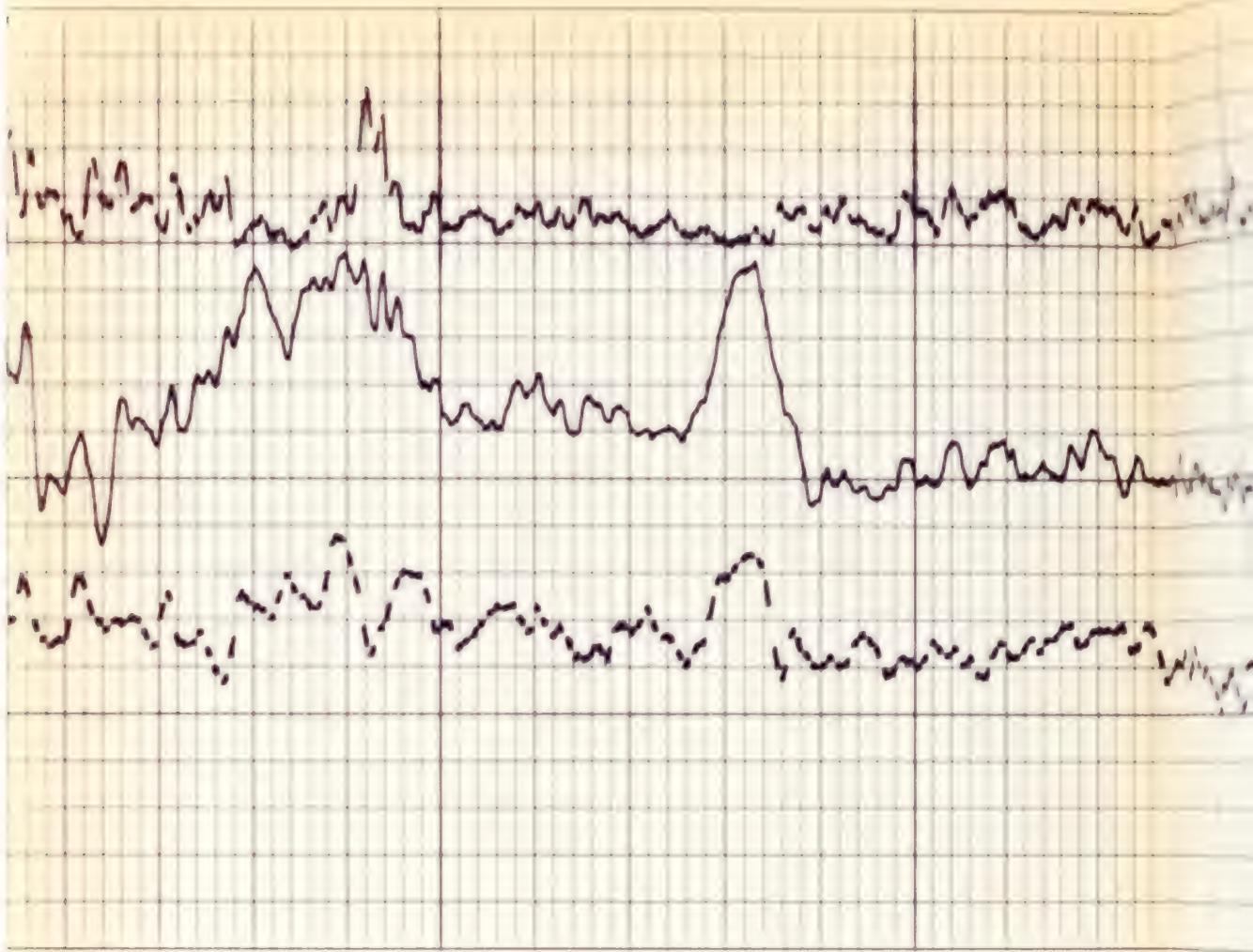
0500



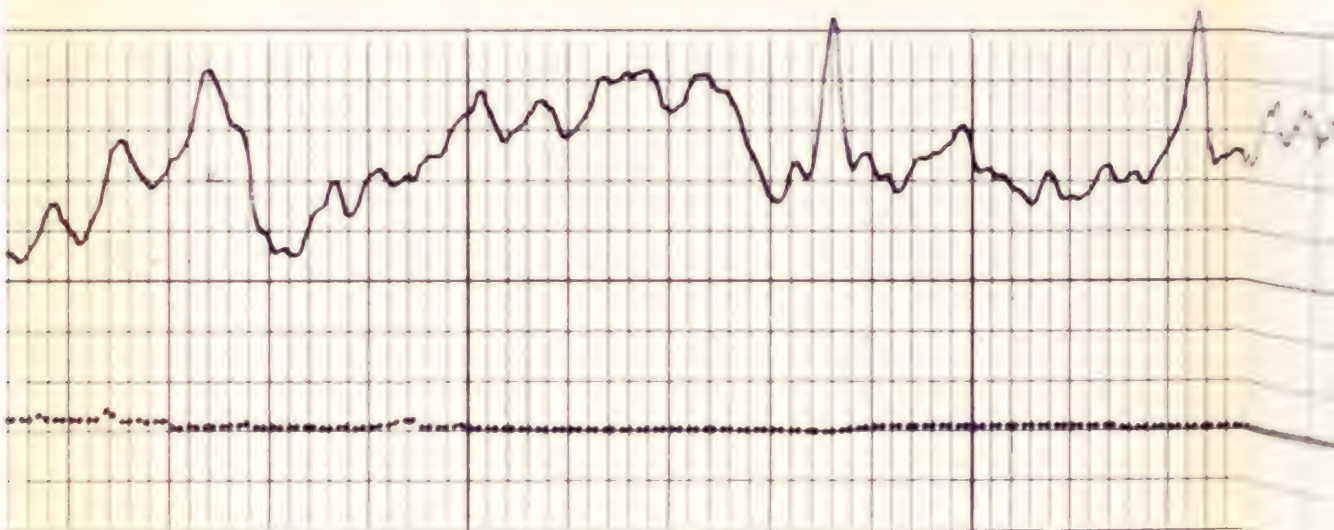


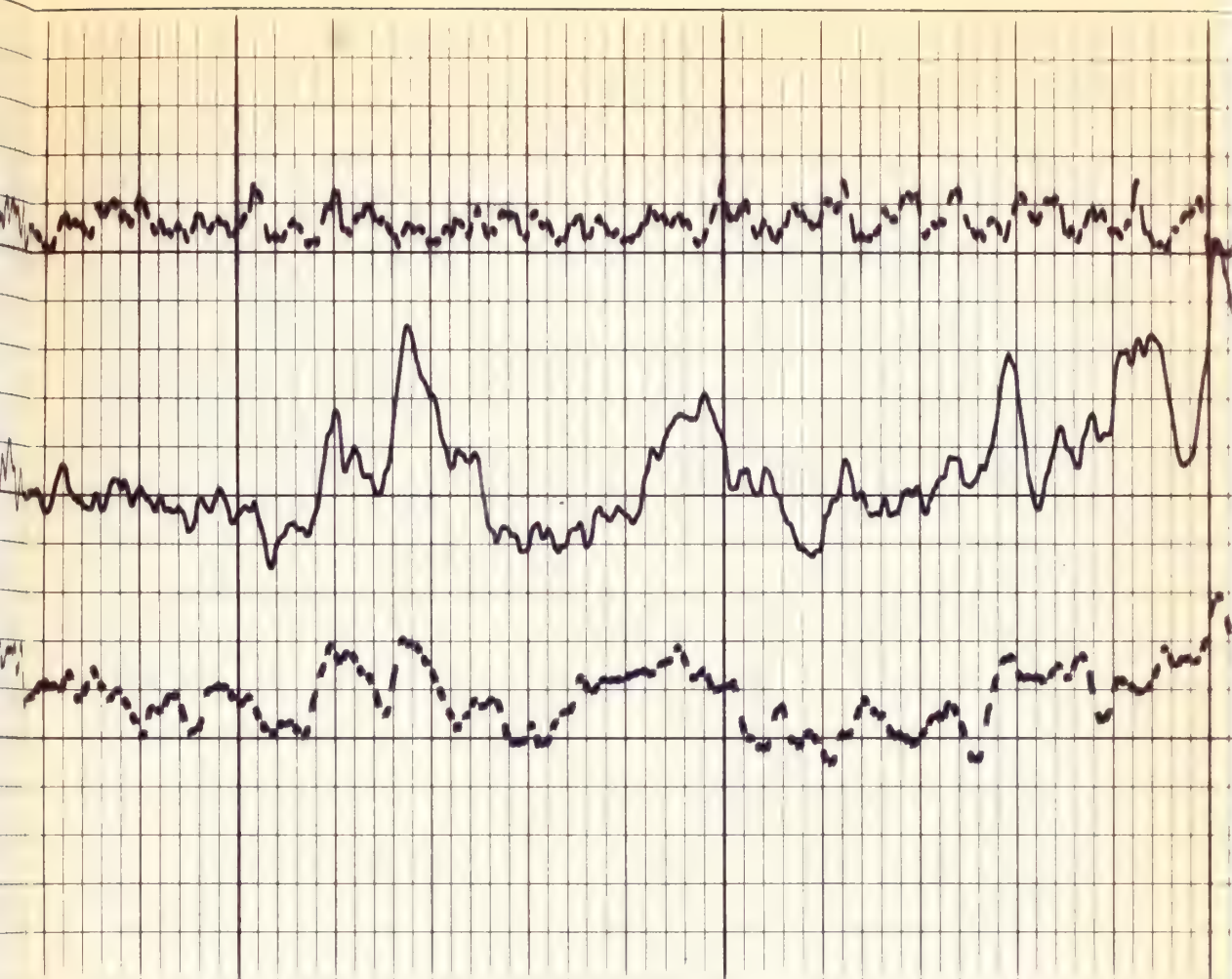
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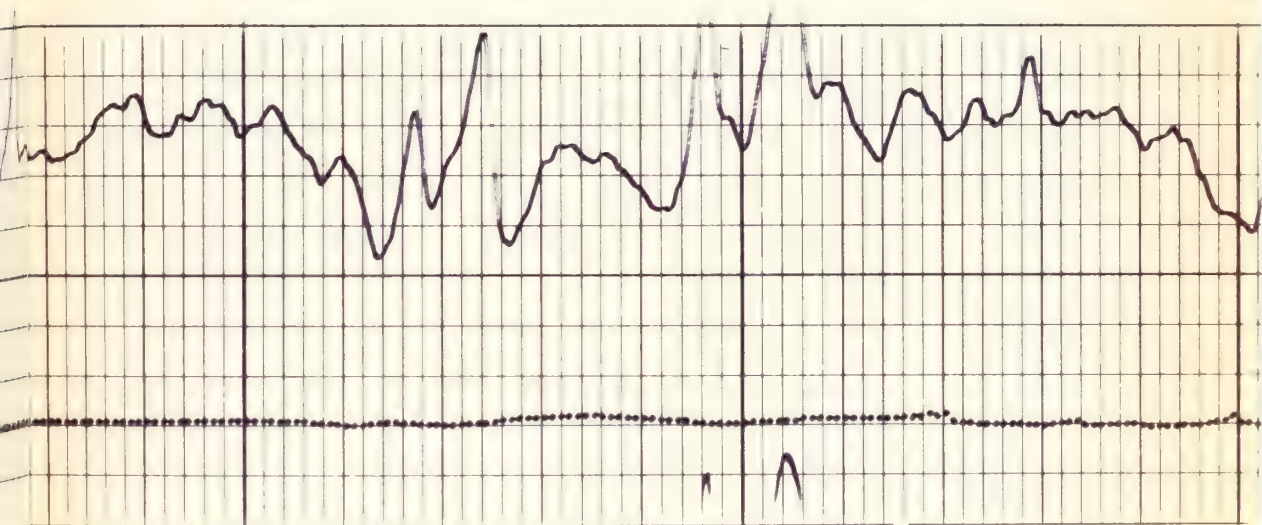
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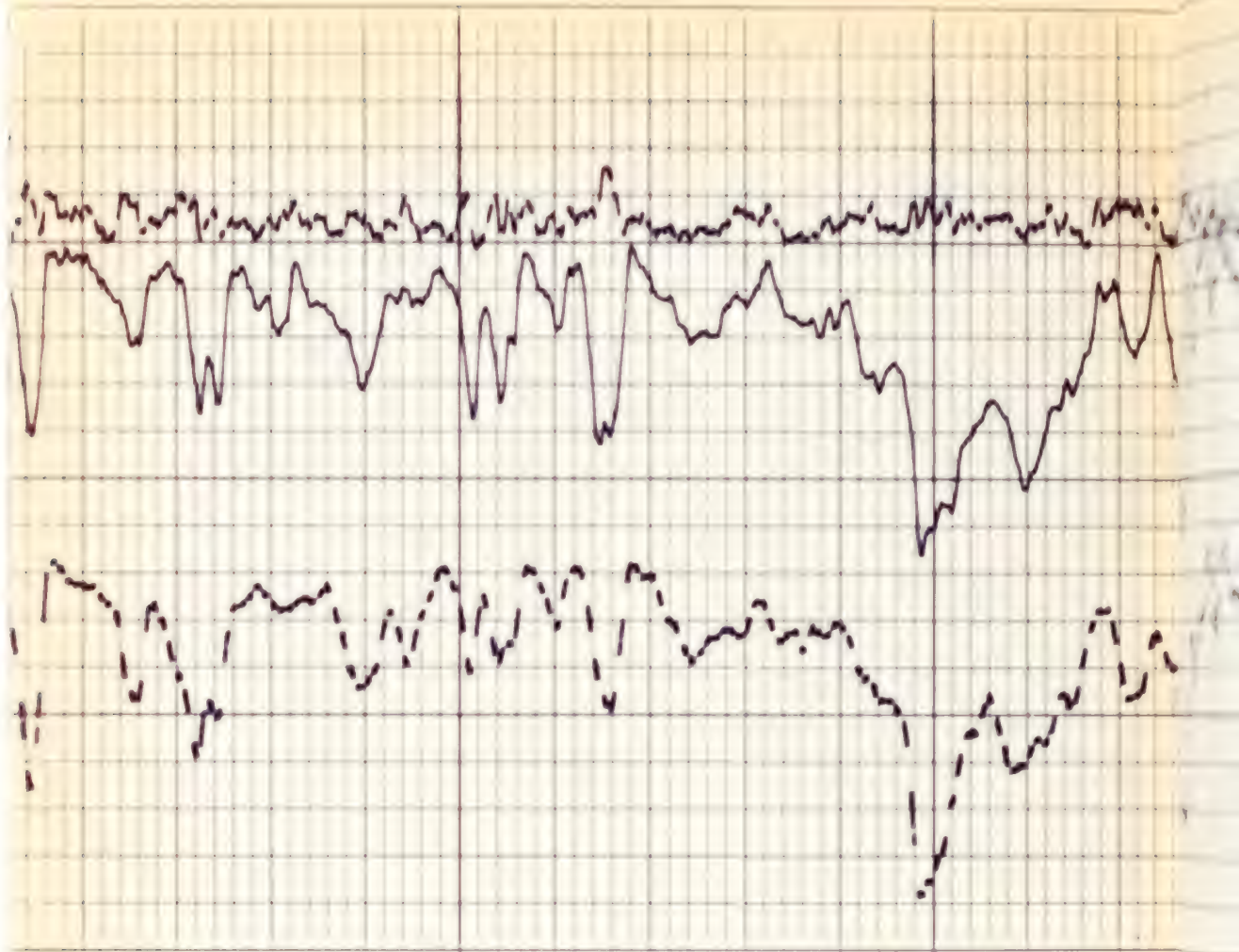




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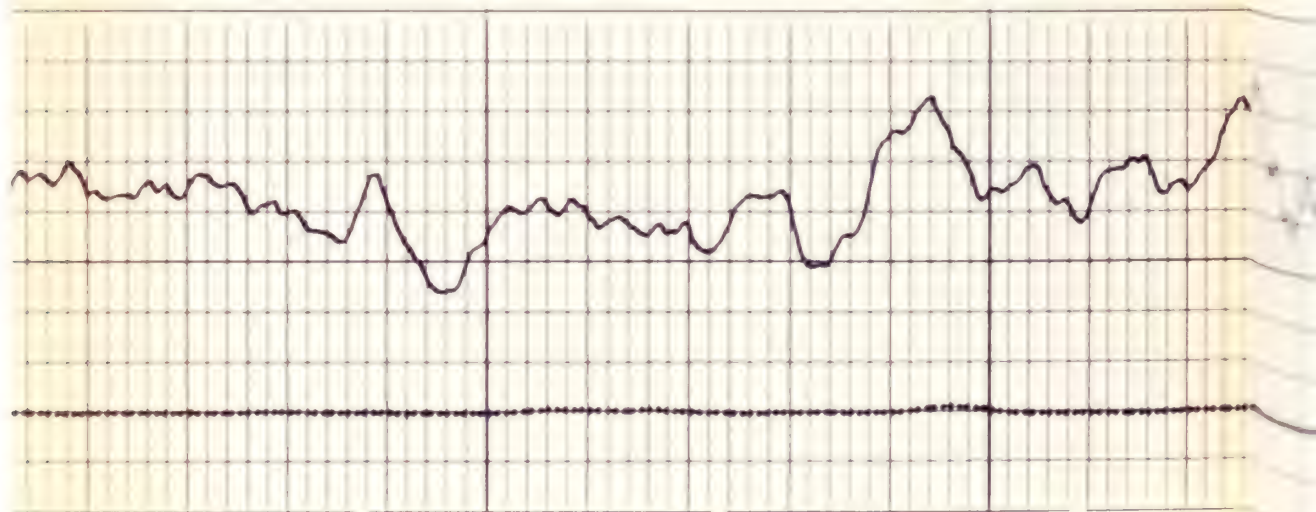
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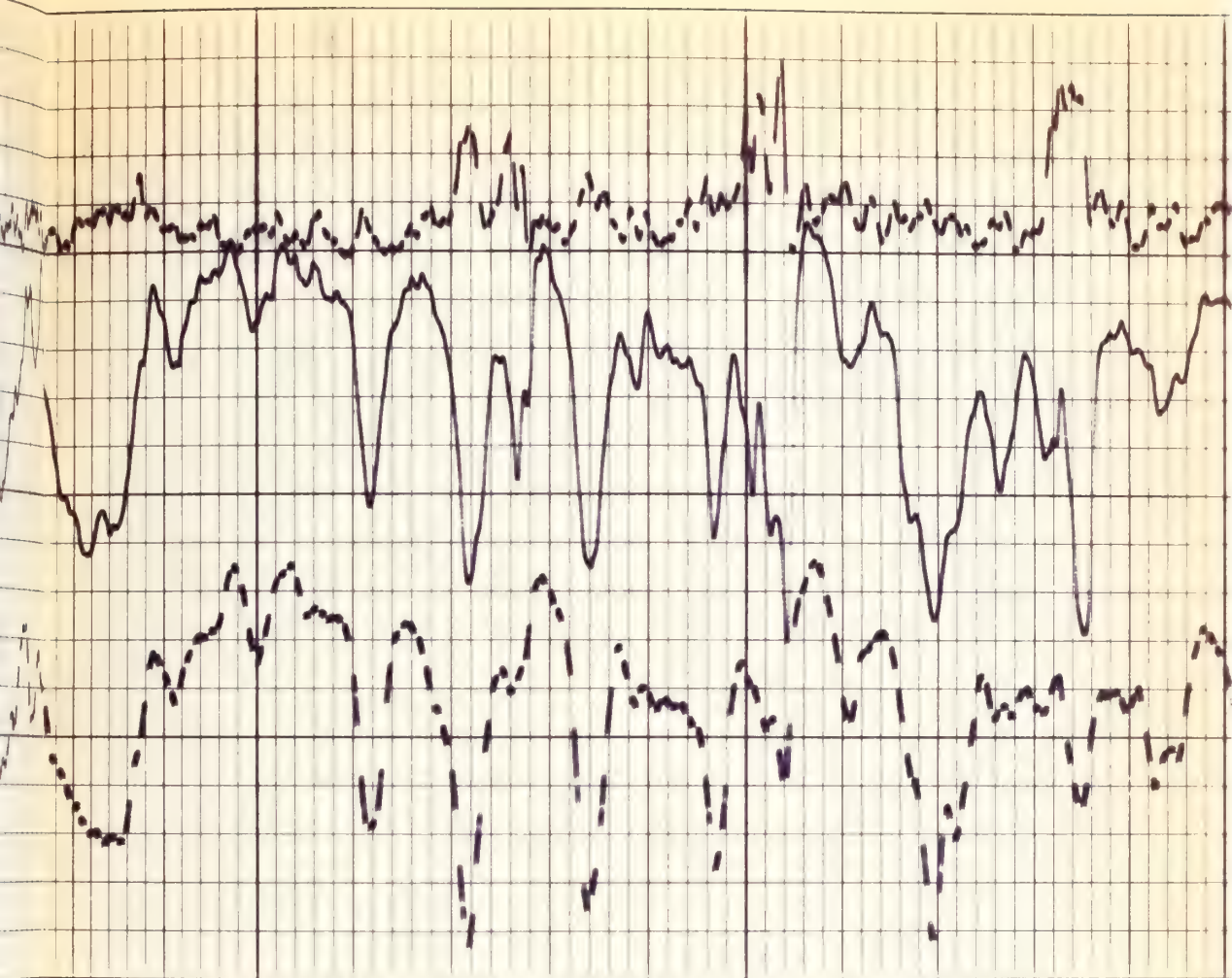




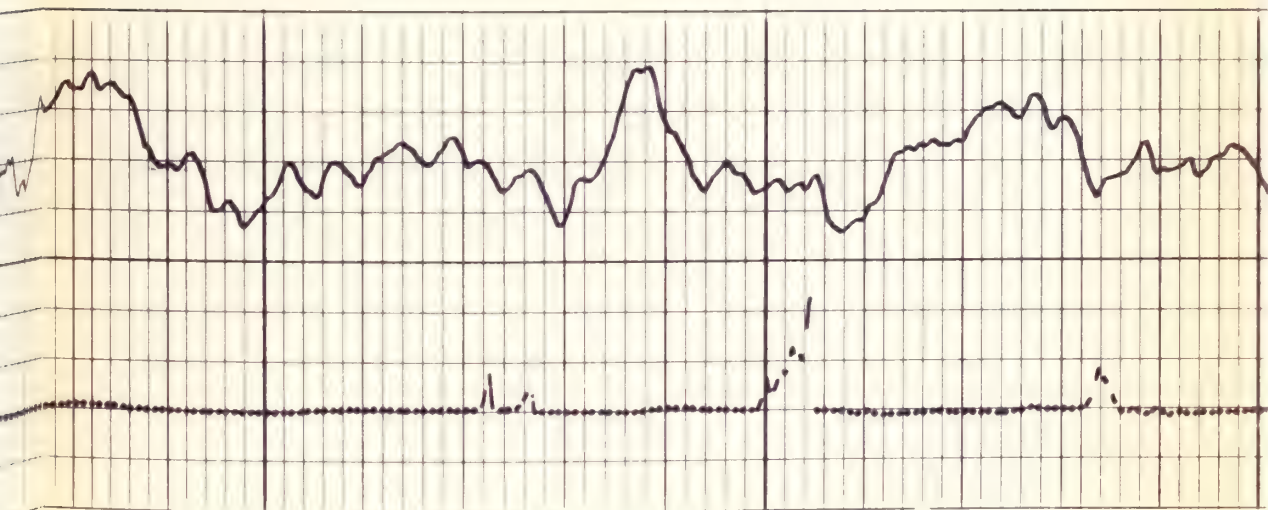
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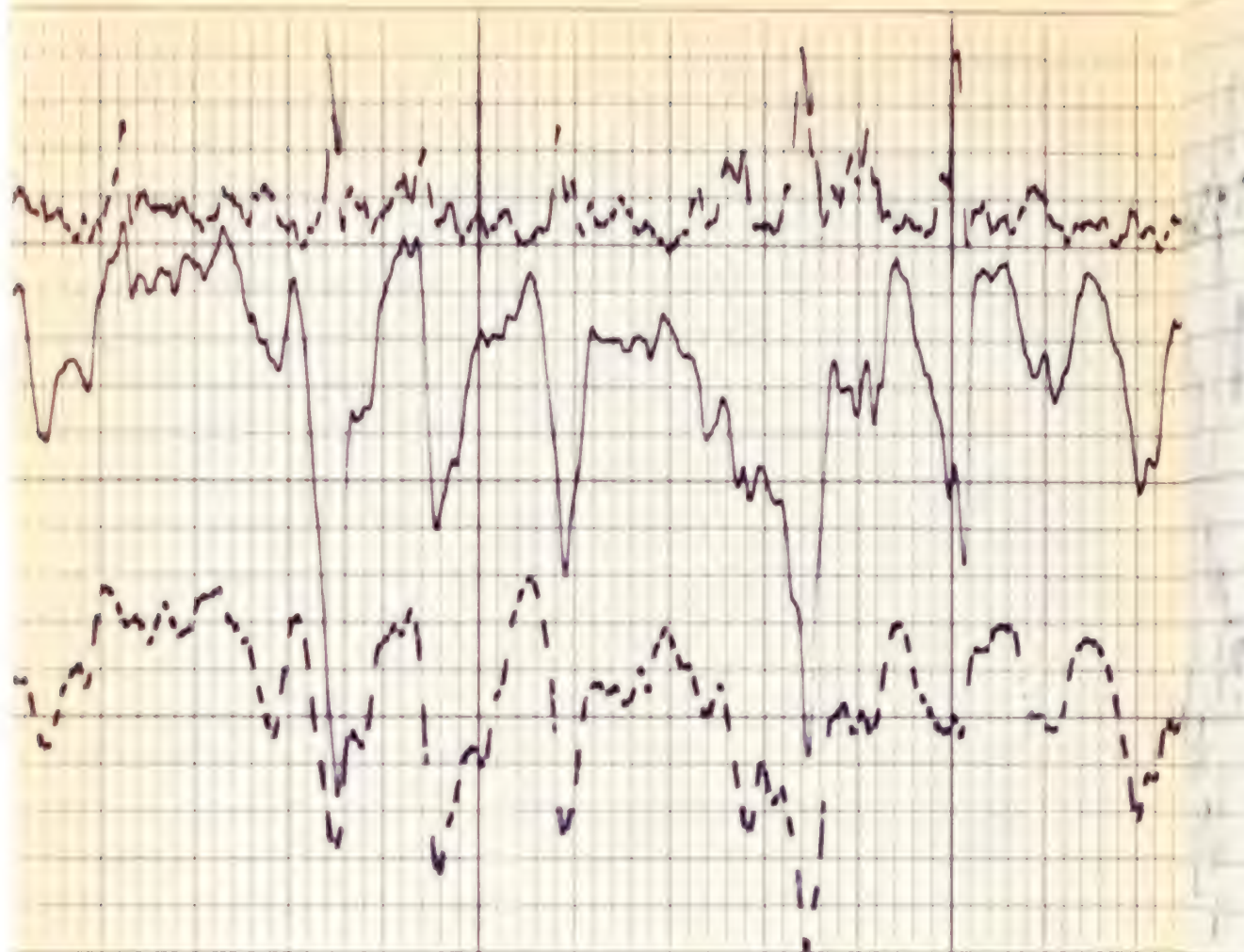
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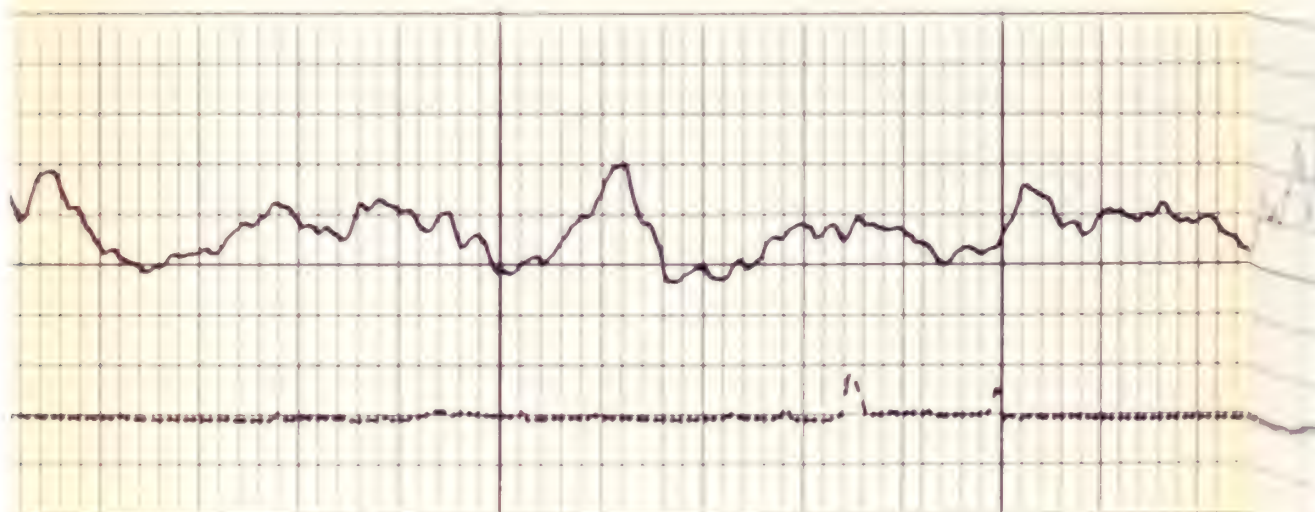


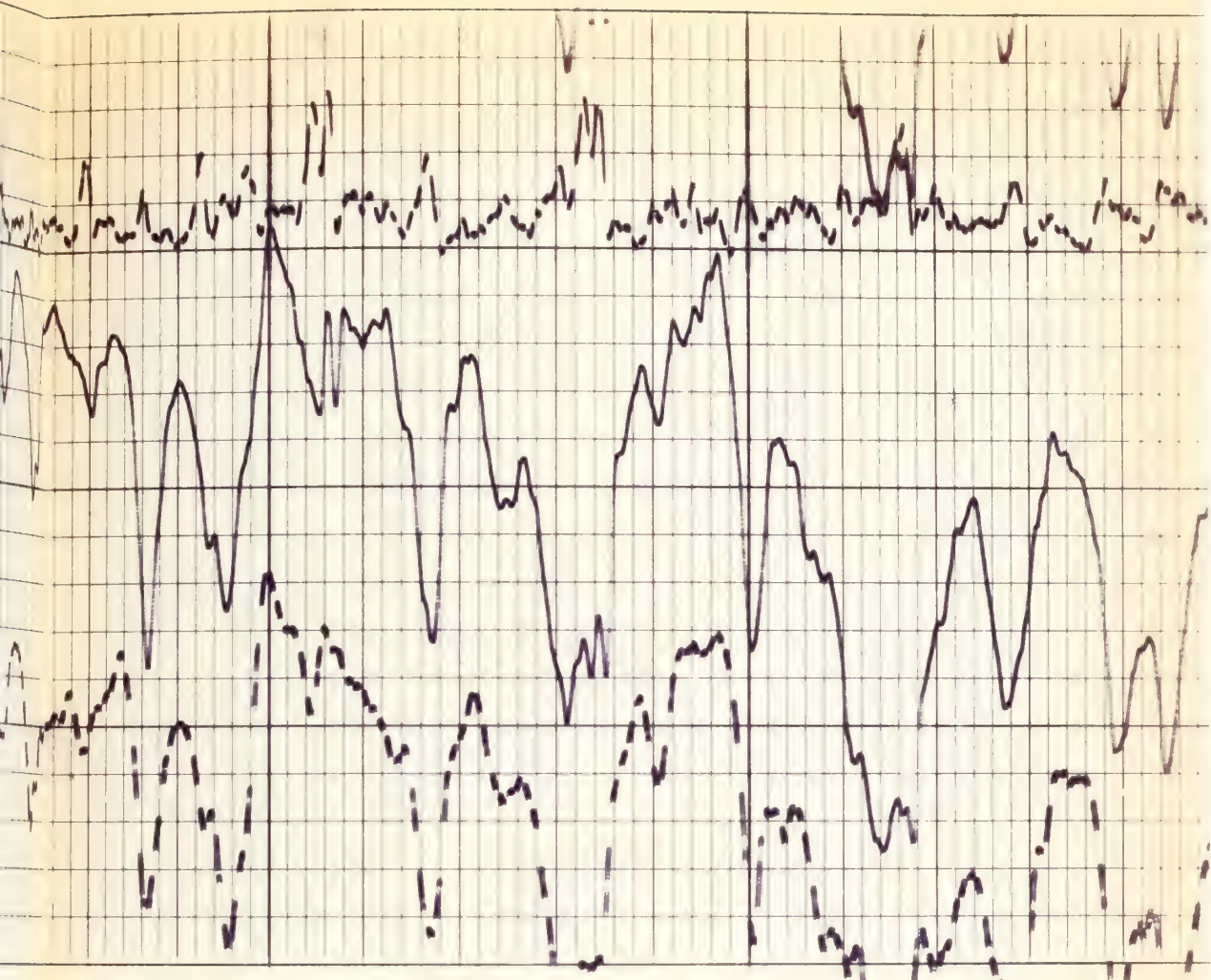
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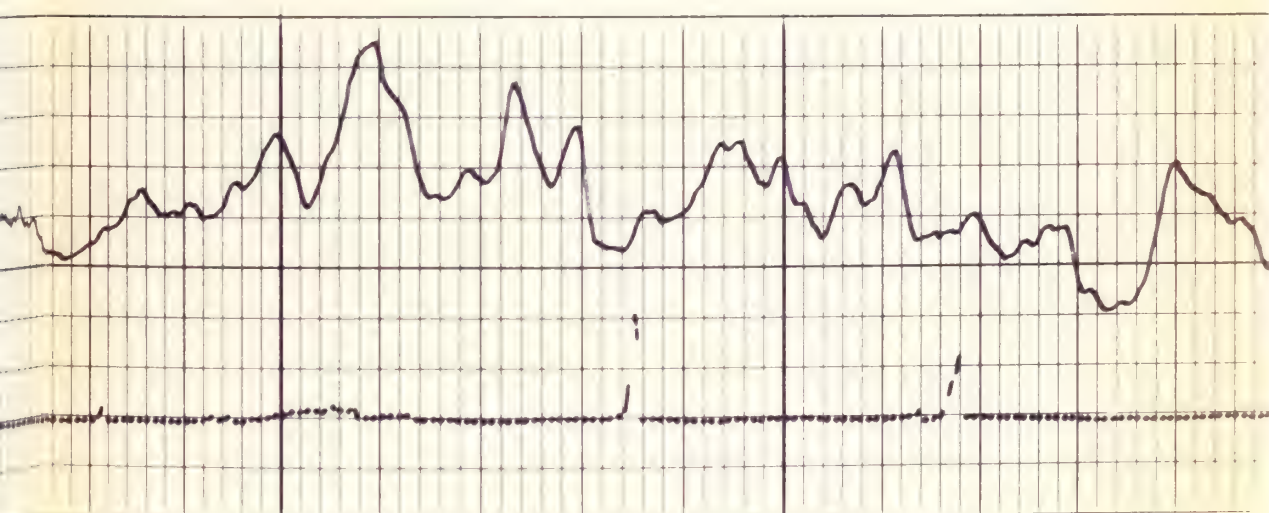
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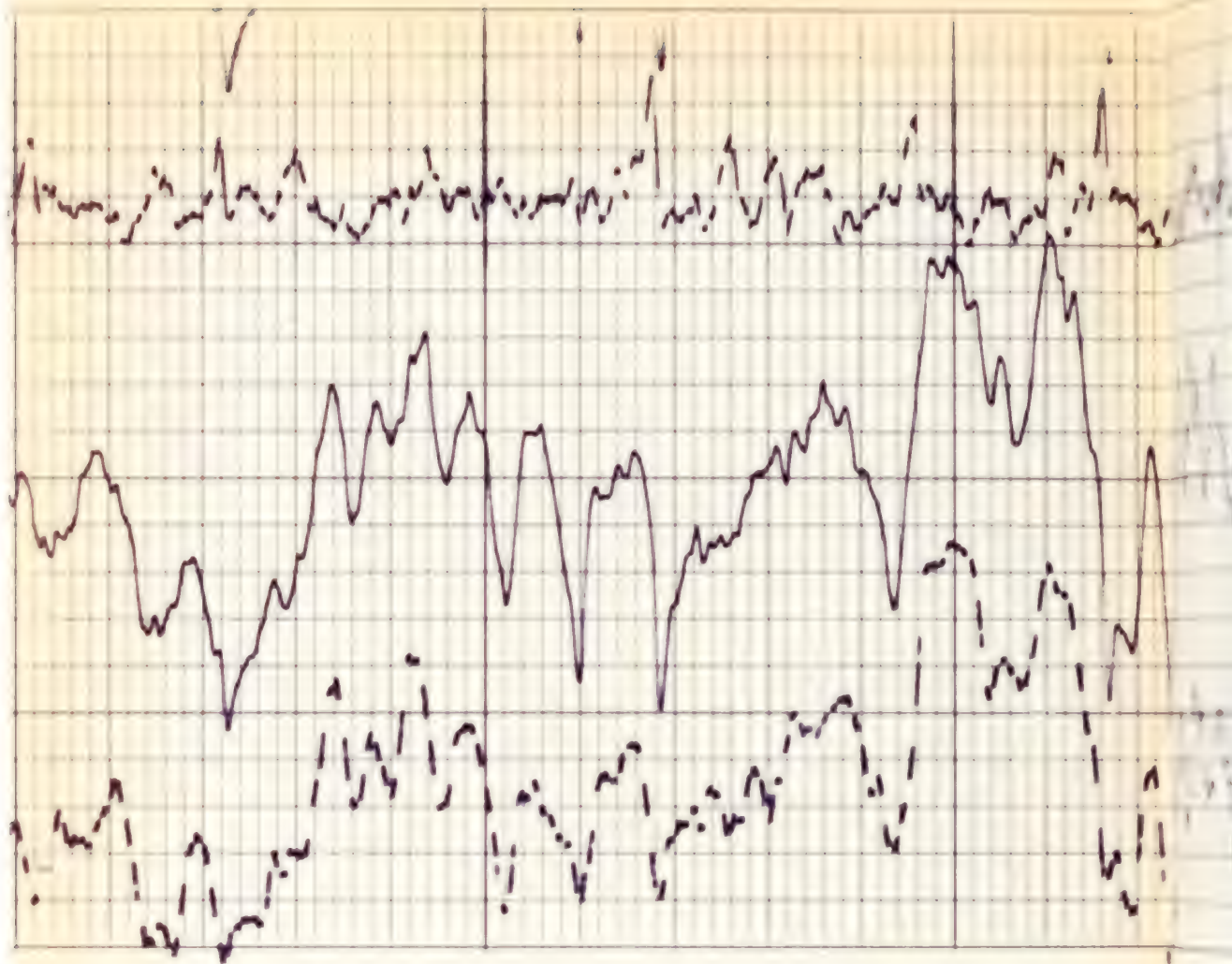




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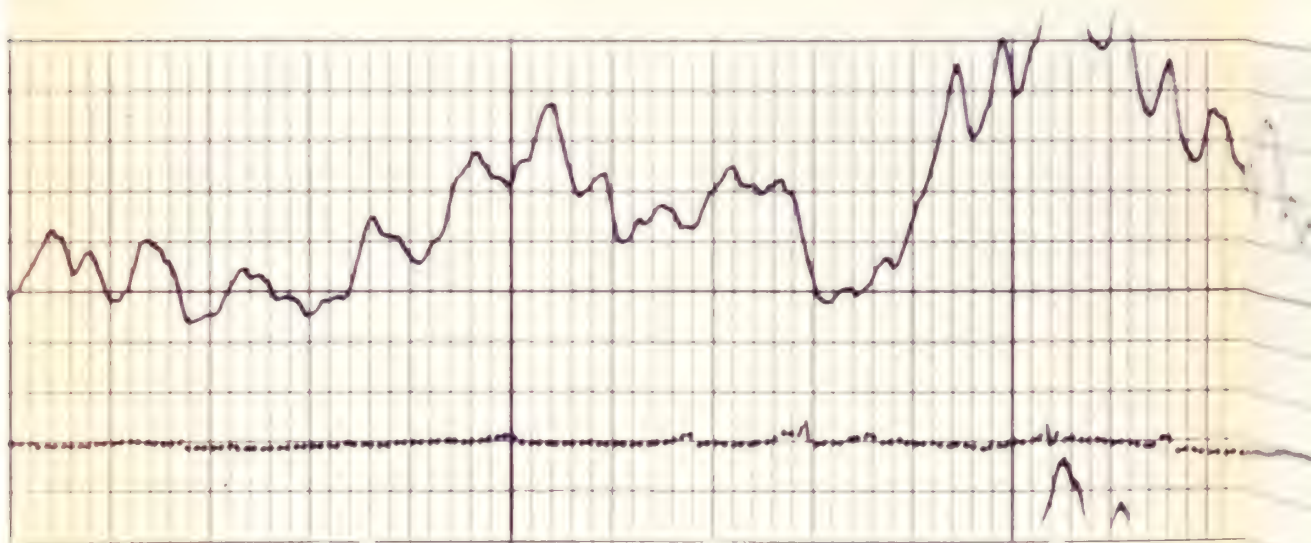
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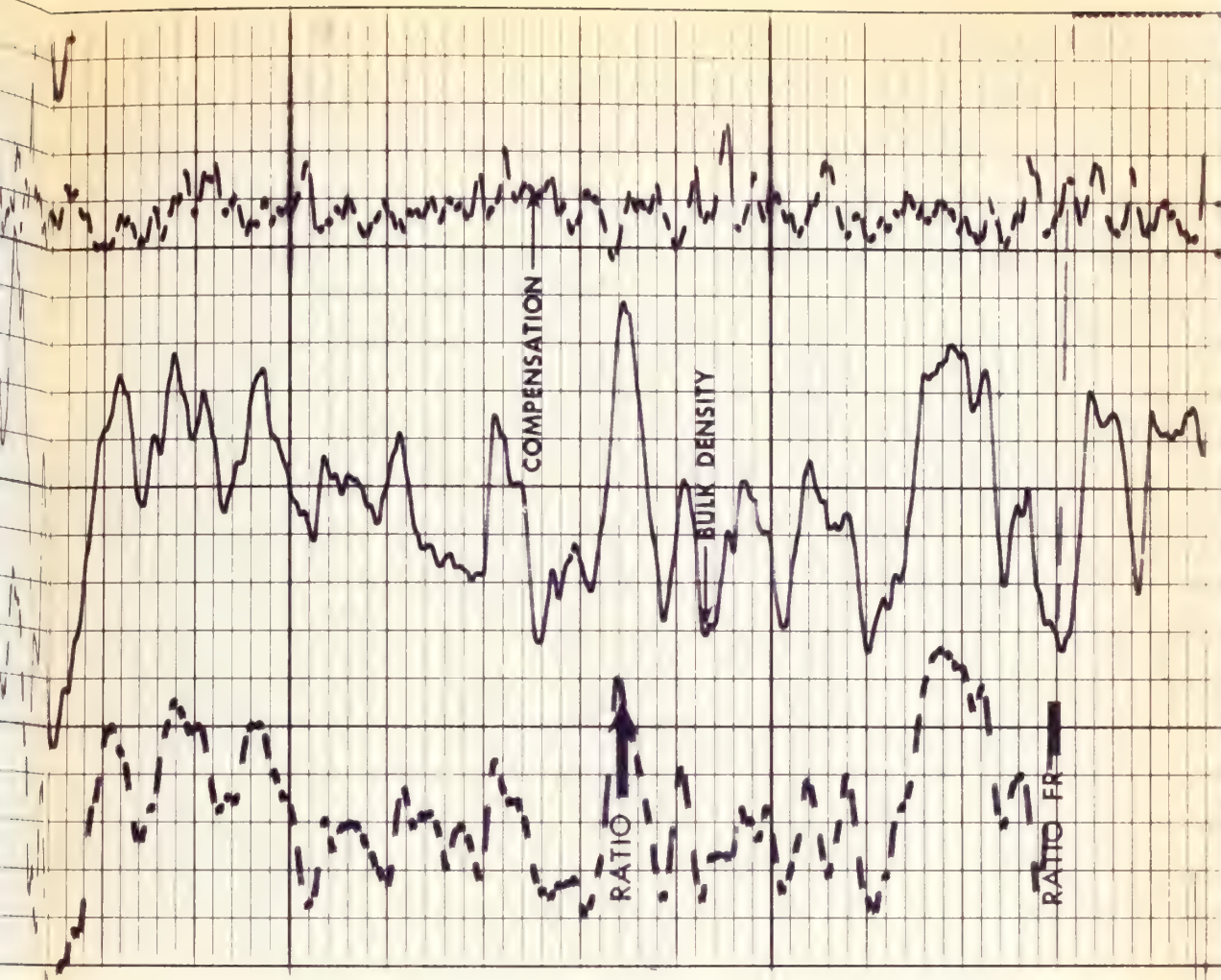




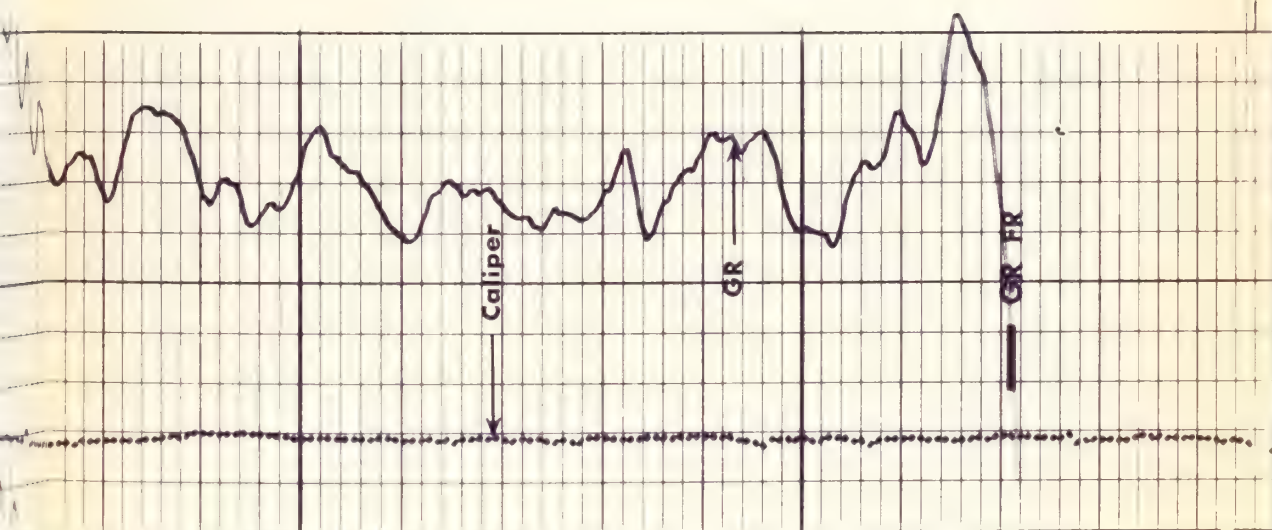
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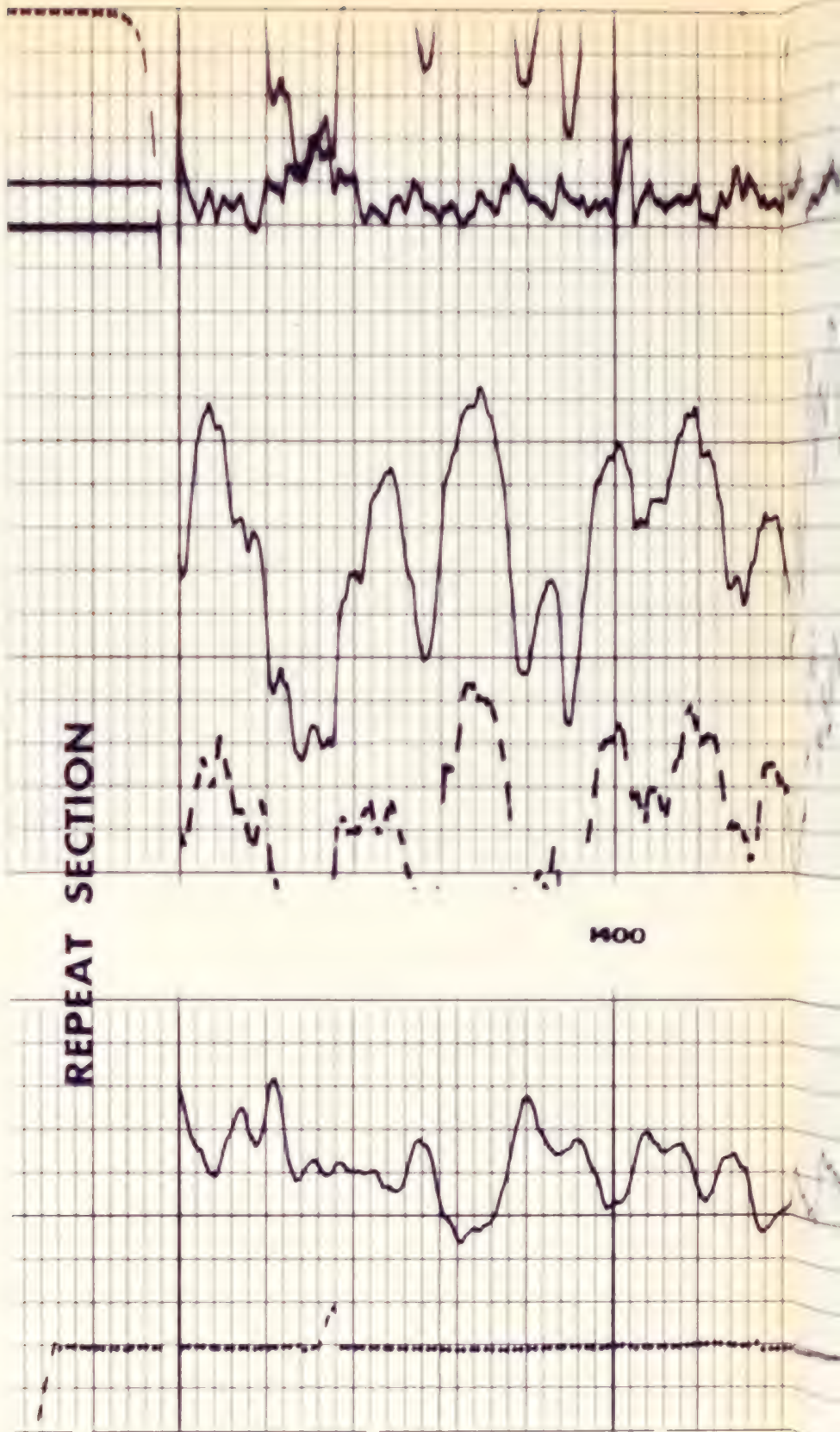


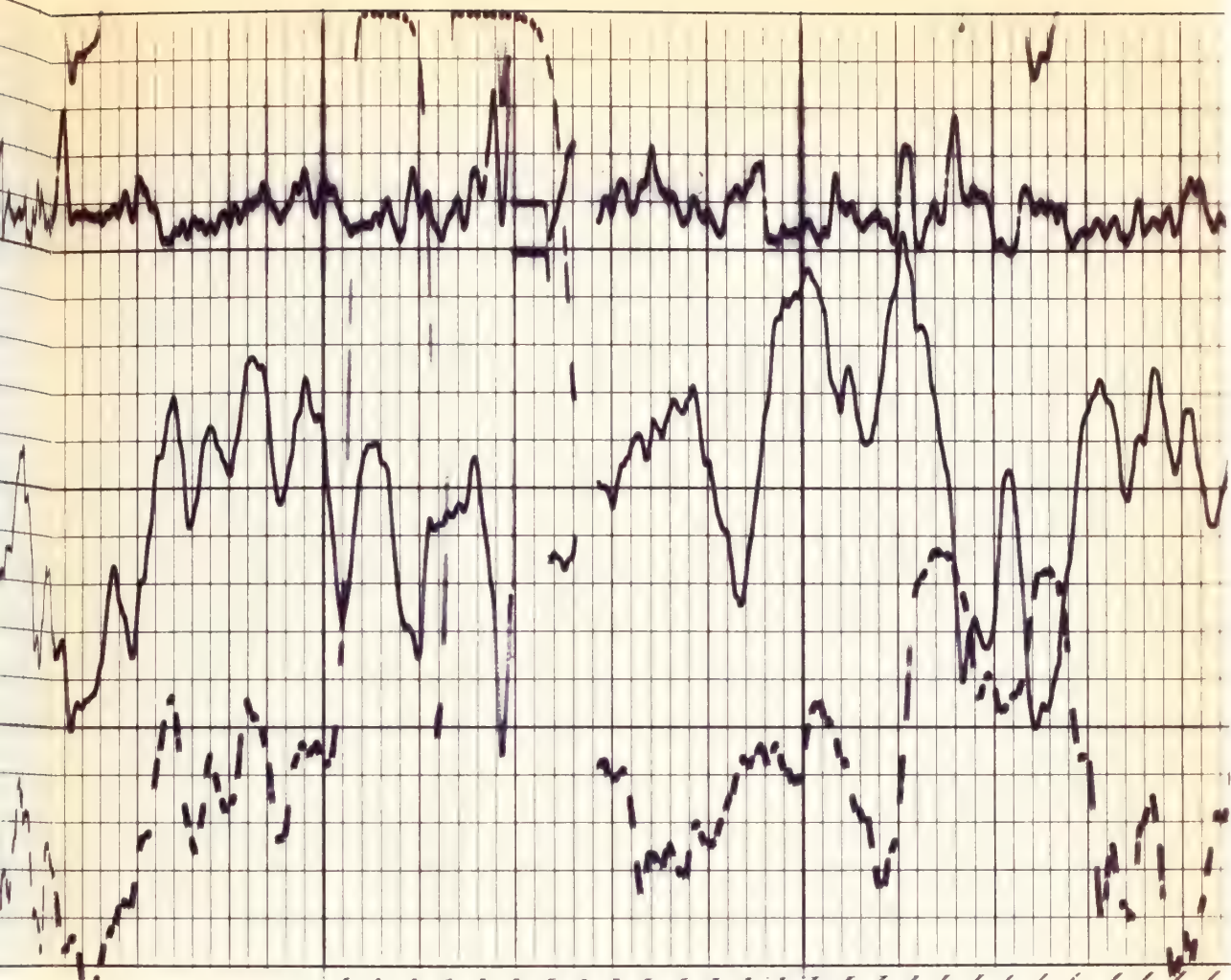
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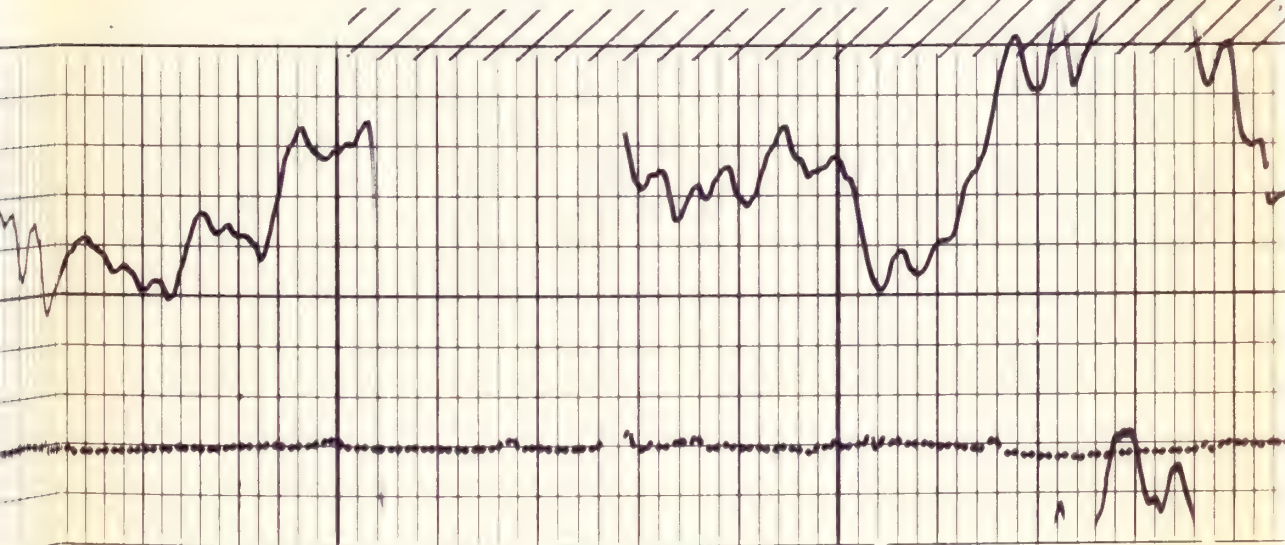
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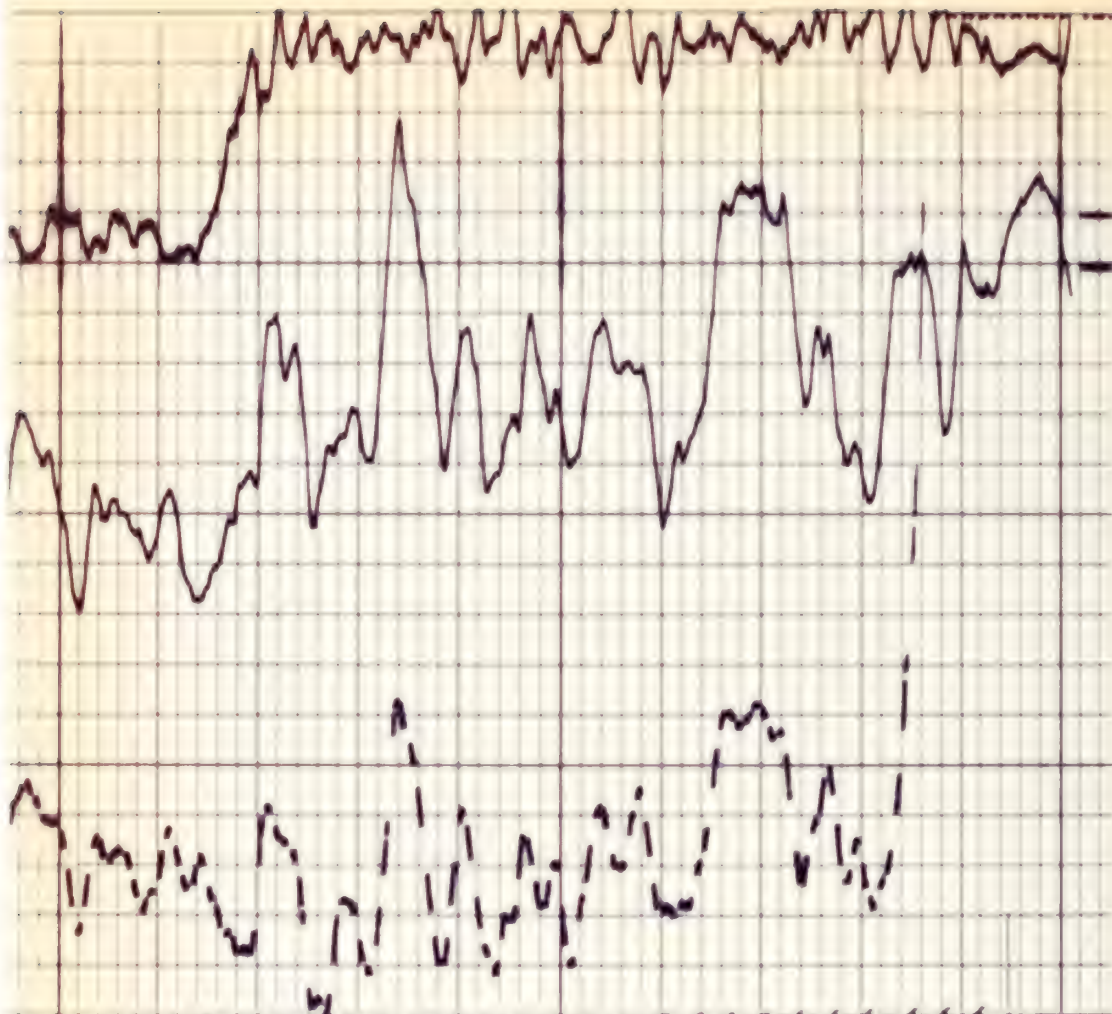
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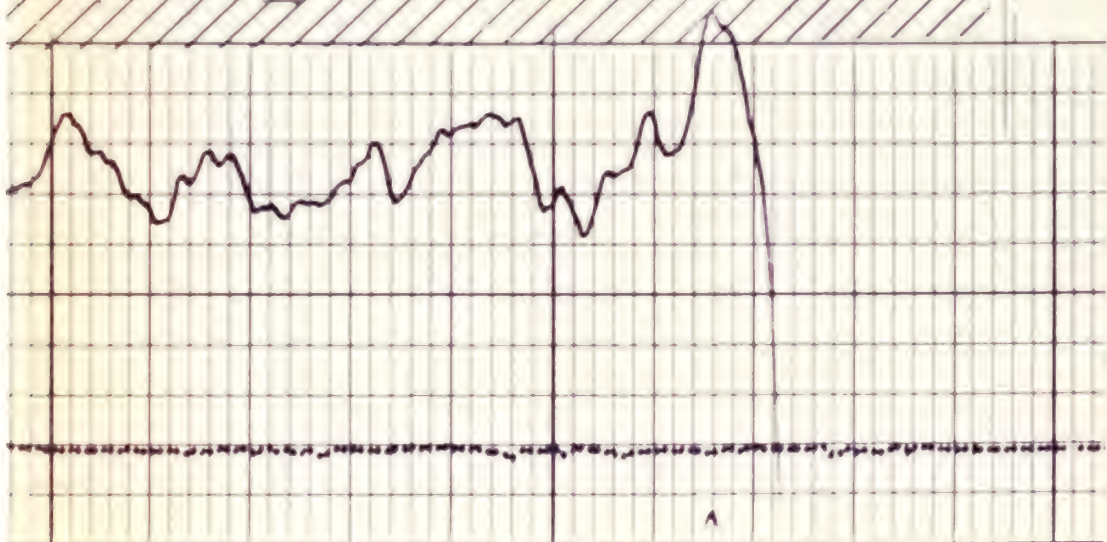


500
IONIZER OUT — CURVES INVALID





MEMORIZER OUT — CURVES 11500 ID



104

GAMMA RAY

API UNITS

50

161

CALIPER

HOLE DIAM. IN INCHES

DEPTHS

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL _____ AQUIFER TEST #1-C

FIELD _____ SORGHAM GULCH _____

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 1645

SCHL. TD 1645

DRLR TD 1640

Elev:

KB

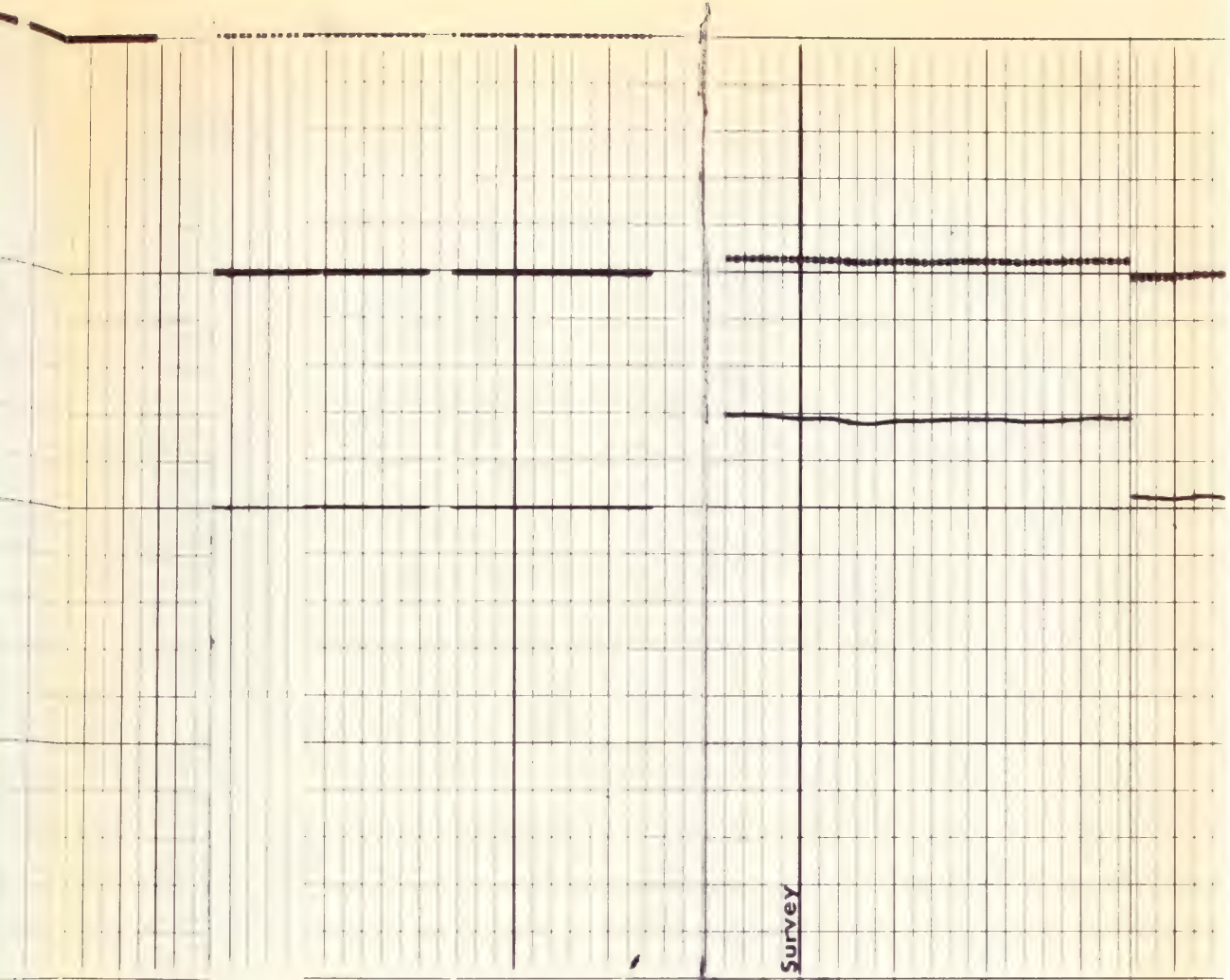
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GL 6900

CALIBRATION RECORD

G. R.: SURFACE CALIBRATION

6



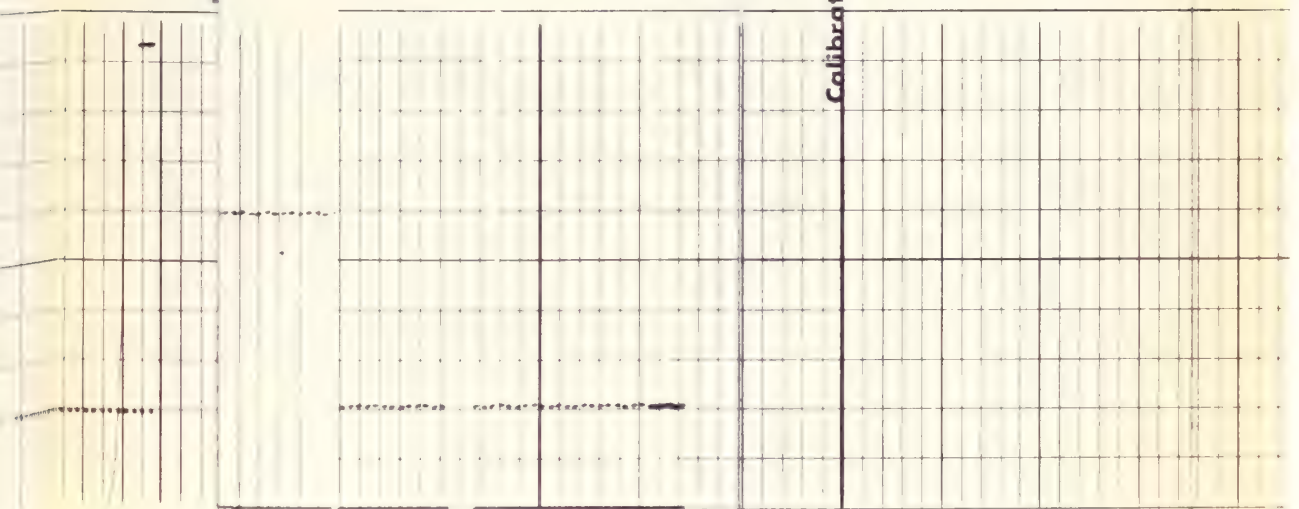
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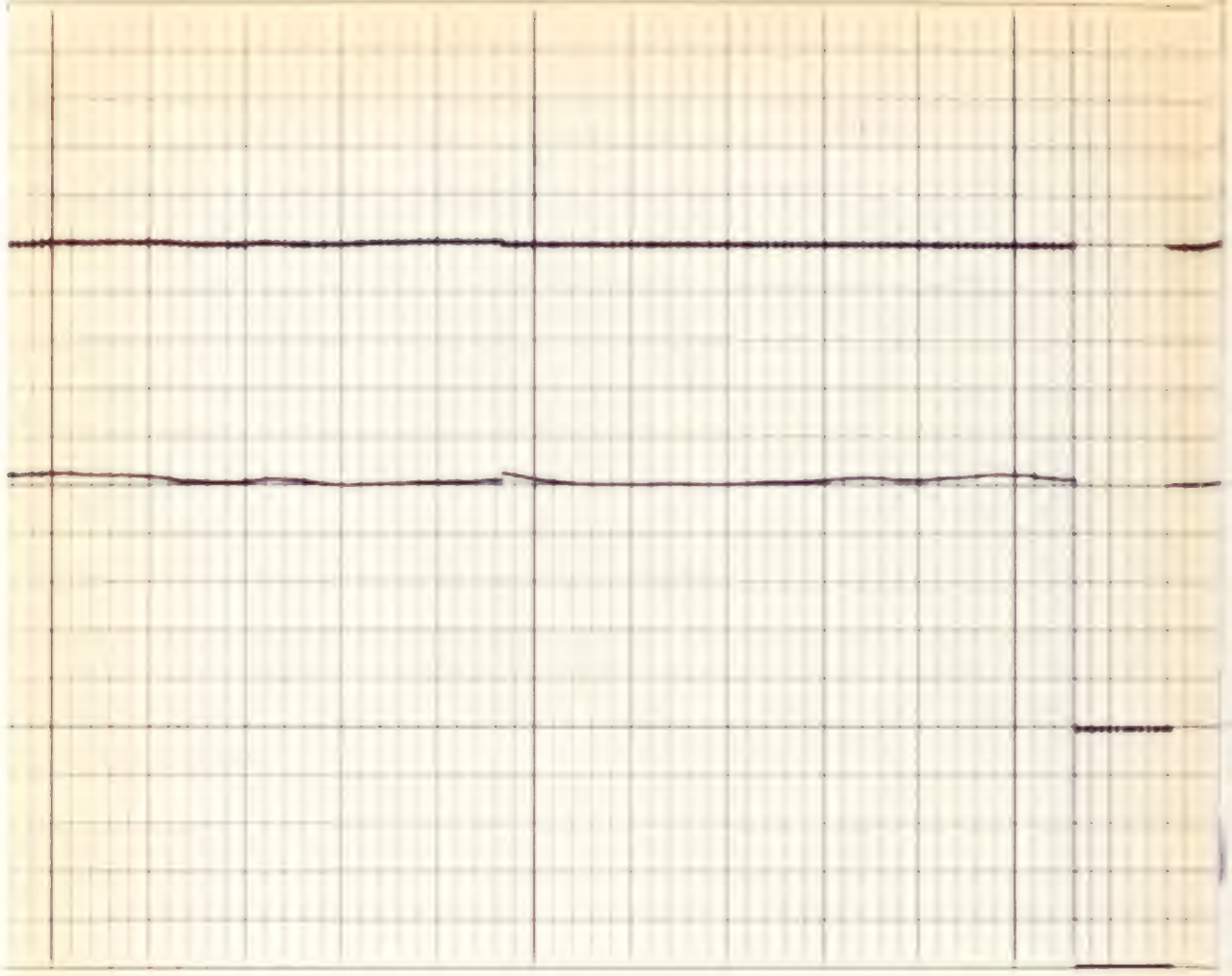
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Calibration after Survey

13





12

11

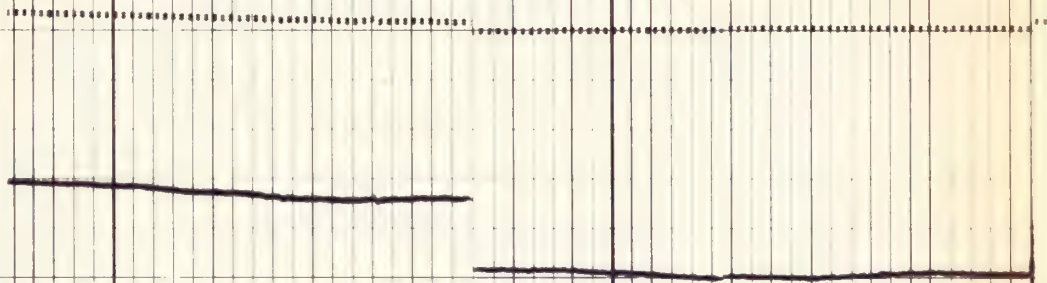
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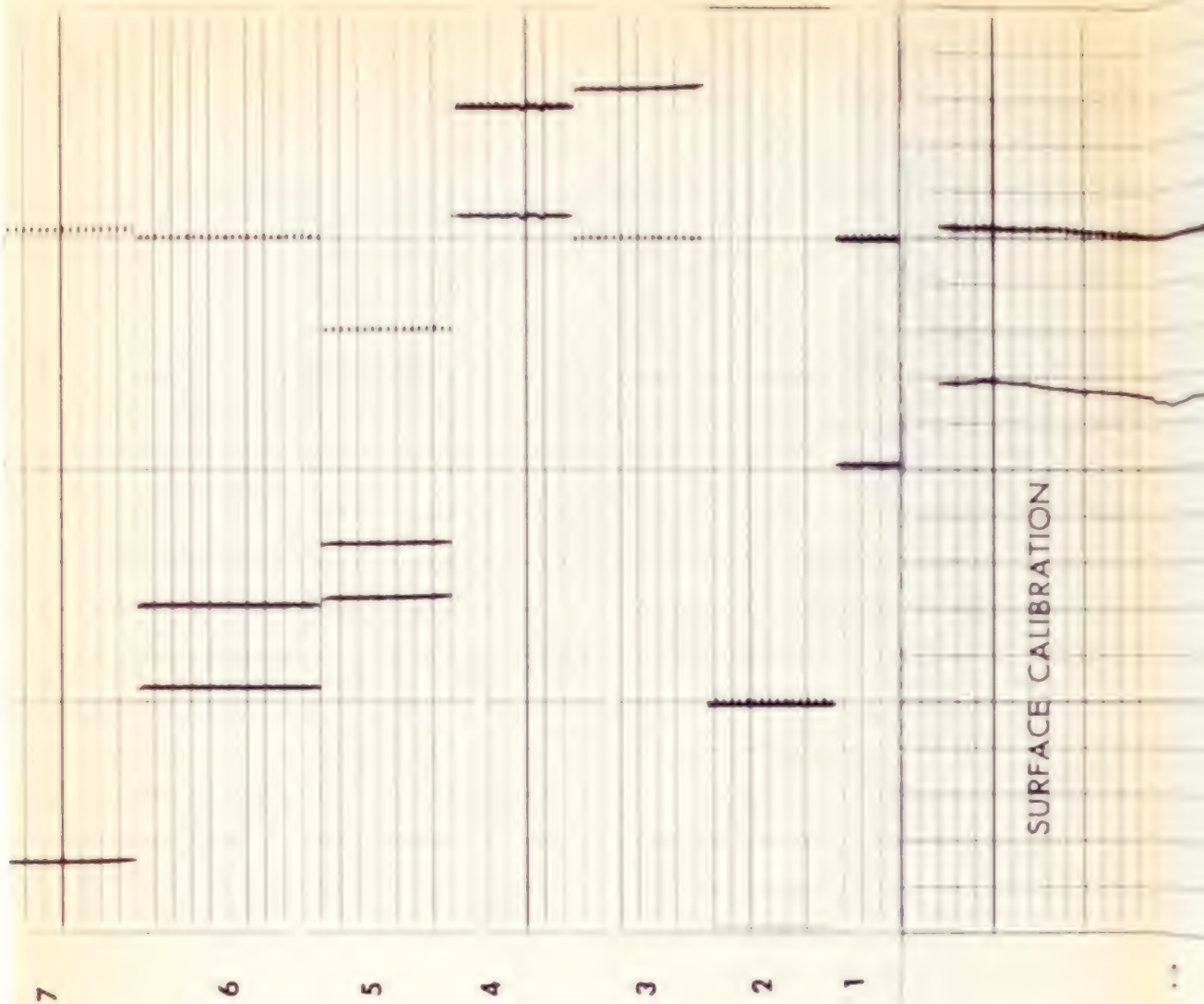
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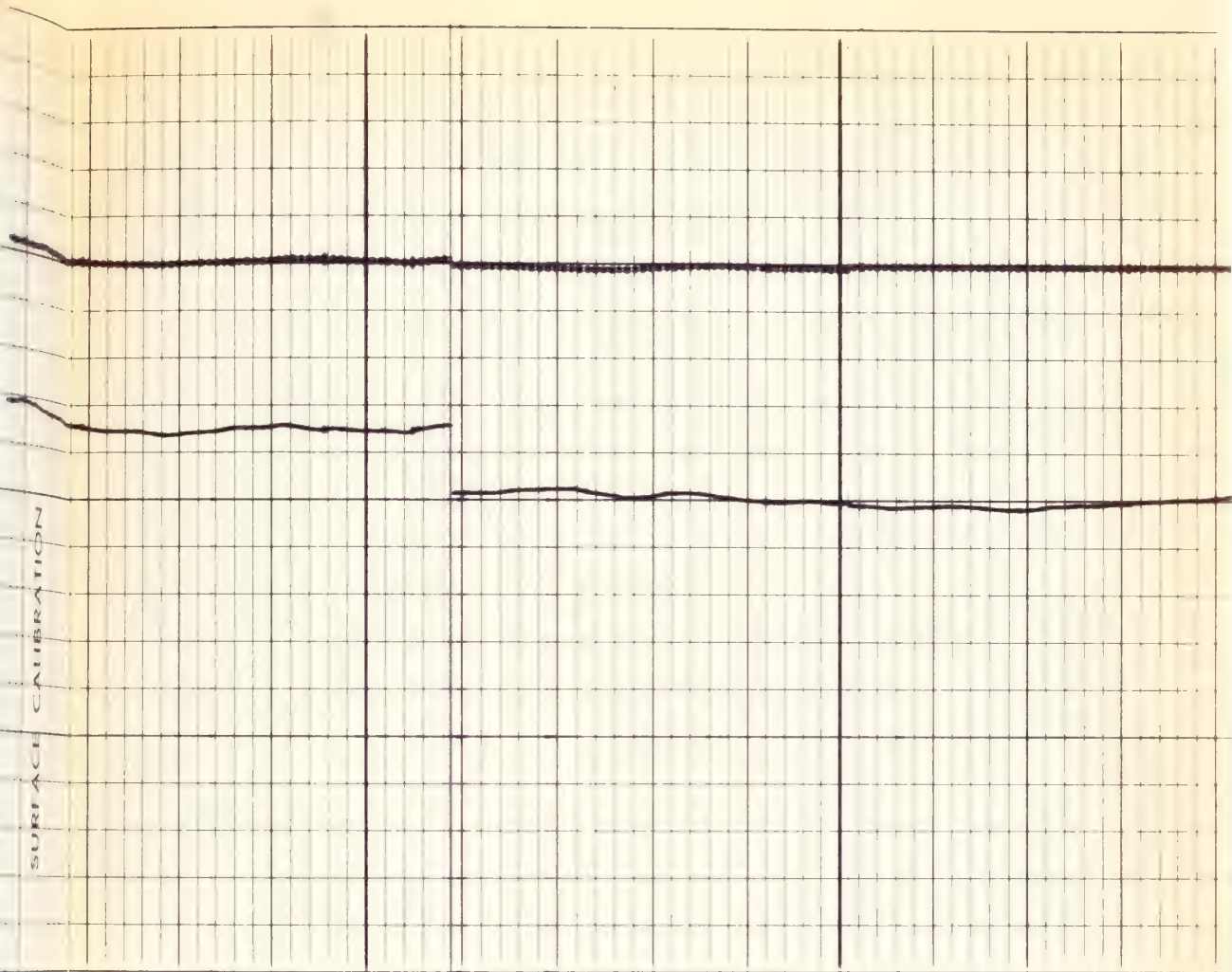
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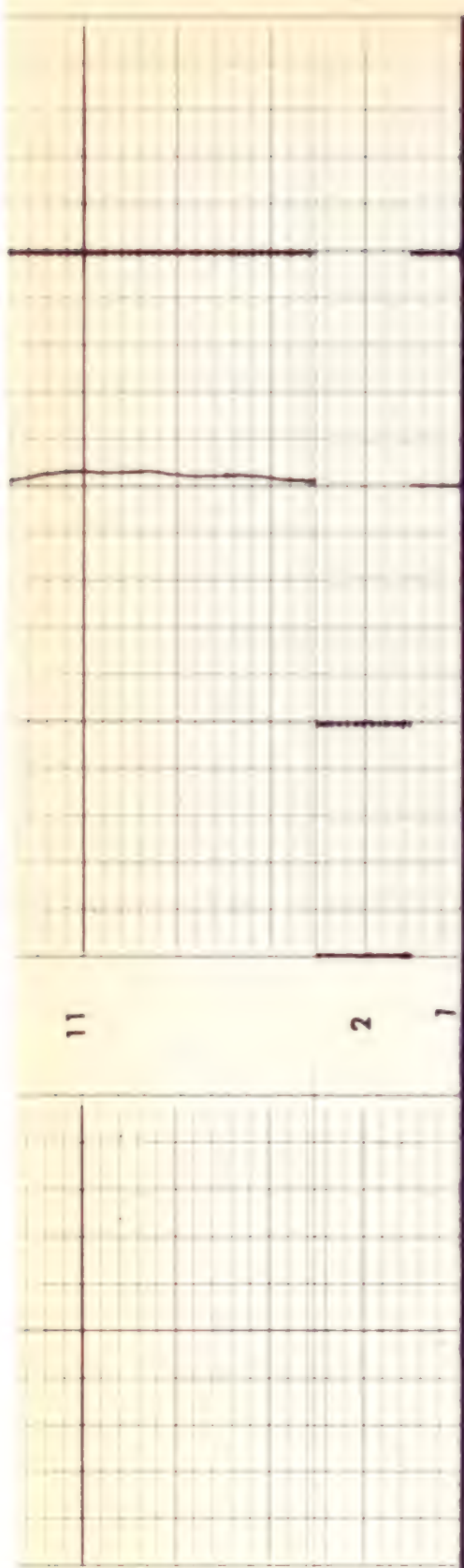
SURFACE CALIBRATION





13

12



COMPENSATED NEUTRON CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDED SENSITIVITY (THRU MEMORIZER IF USED)

PANEL TEST

| RATIO | LS <input type="checkbox"/> | OH POROSITY | DOL <input type="checkbox"/> | SS <input type="checkbox"/> | CH POROSITY | LS <input type="checkbox"/> |
|-------|-----------------------------|--|------------------------------|-----------------------------|-------------|-----------------------------|
| 3. | 1.6 | SS <input checked="" type="checkbox"/> 4.9 | 0.2 | 2.4 | 0.1 | |
| 4. | 15.6 | 19.7 | 8.1 | 13.0 | 9.0 | |
| 5. | 31.3 | 36.0 | 25.2 | 29.1 | 24.1 | |
| 6. | 52.2 | 61.4 | 53.0 | 52.2 | 45.2 | |

POROSITY NORMALIZED WITH CNB-A IN PLACE

7A. TOOL IN NCT-B

LOG POSITION WITH CNB-A IN PLACE

8A. LOG POSITION WITH TOOL IN NCT-B

| LS | OH | SS | DOL | CH | LS |
|----|----|------|------|---------|------|
| 18 | | 22.2 | 10.4 | SS 15.3 | 11.2 |

$$\text{RATIO (NORMALIZED)} = \frac{\text{RATIO (NCT-B)}}{2.17} \quad \text{RATIO LOG}$$

FORMATION DENSITY COMPENSATED CALIBRATION CODING

- MECHANICAL ZERO
- RECORDER SENSITIVITY

PANEL TEST

FDC LIQUID

| POS | ρ | $\Delta\rho$ |
|-----|--------|--------------|
| # 1 | 2.92 | .00 |
| # 2 | 2.78 | +.14 |
| # 3 | 2.42 | -.10 |
| # 4 | 2.35 | .00 |
| # 5 | 2.08 | .01 |

MECHANICAL ZERO CALIPER

- 8" RING
- 12" RING
- TOOL CALIBRATE #1 SET $\rho = 2.50$
- TOOL CALIBRATE #2 SET $\Delta\rho = .00$
- LOG POSITION $\rho = 2.59, \Delta\rho = .015$

CALIBRATION RECORD

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL AQUIFER TEST #1-C

FIELD SORGHAM GULCH

COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 1645
SCHL. TD 1646
DRLR TD 1640
Elev: KB
DF
GL 6909

THE UNIVERSITY OF CHICAGO
LIBRARY

1911

1912

1913

1914

1915

1916

1917

Schlumberger

TEMPERATURE LOG

COUNTY RIO BLANCO, COLO.
FIELD or
LOCATION SORGHUM GULCH
WELL AQUIFER TEST #1-C
COMPANY ATLANTIC RICHFIELD

COMPANY THE ATLANTIC RICHFIELD COMPANY

WELL AQUIFER TEST #1-C

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

LOCATION

Sec. 7 Twp. 3-S Rge. 96-W

Other Services:

DIL
FDC--CNL-GR
BHC-GR

Permanent Datum: GL; Elev.: 6909
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. _____
D.F. _____
G.L. 6909

| | | | | | |
|--------------------|----------|-------|--------------|----|----|
| Date | 8/18/74 | | | | |
| Run No. | ONE | | | | |
| Depth-Driller | 1640 | | | | |
| Depth-Logger | 1646 | | | | |
| Btm. Log Interval | 1646 | | | | |
| Top Log Interval | 340 | | | | |
| Casing-Driller | 8-5/8 | @ | 59 | @ | |
| Casing-Logger | 61 | | | | |
| Casing Size | 1 | 8-5/8 | To 59 | To | To |
| | 2 | | To | To | To |
| Casing Weight | 1 | | | | |
| | 2 | | | | |
| Casing Thickness | 1 | | | | |
| | 2 | | | | |
| Bit Size | 1 | To | | To | To |
| | 2 | To | | To | To |
| Type Fluid in Hole | WATER | | | | |
| Dens. | Visc. | 8.3 | | | |
| Time Since Circ. | 8 HOURS | | | | |
| BHT | 86 | | | | |
| Equip. | Location | 5602 | GR. JUNCTION | | |
| Recorded By | BARGHOUI | | | | |
| Witnessed By | TAIT | | | | |

The well name, location and burette reference data were furnished by the customer

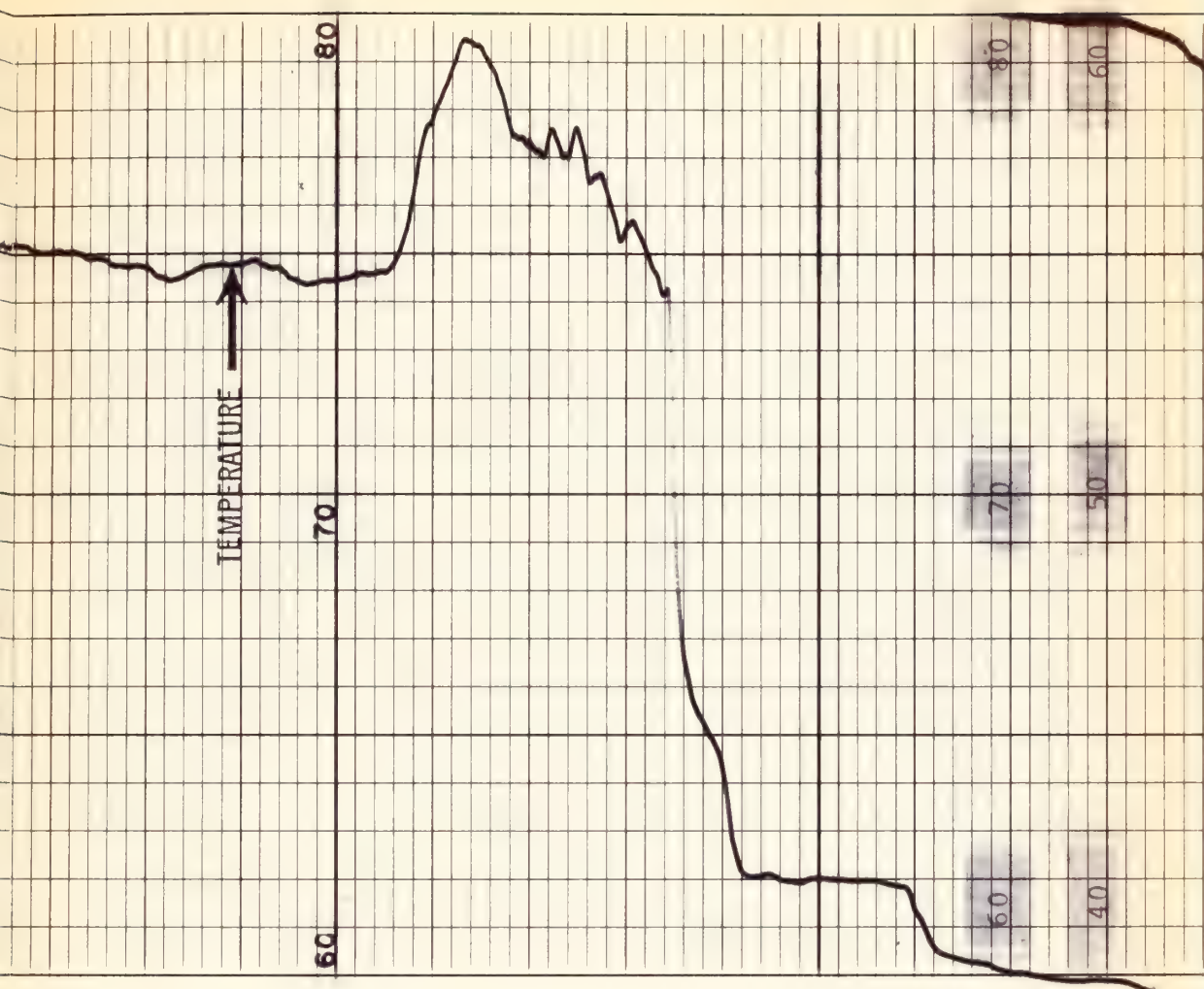
REMARKS: 8/18 @ 1400 HOURS

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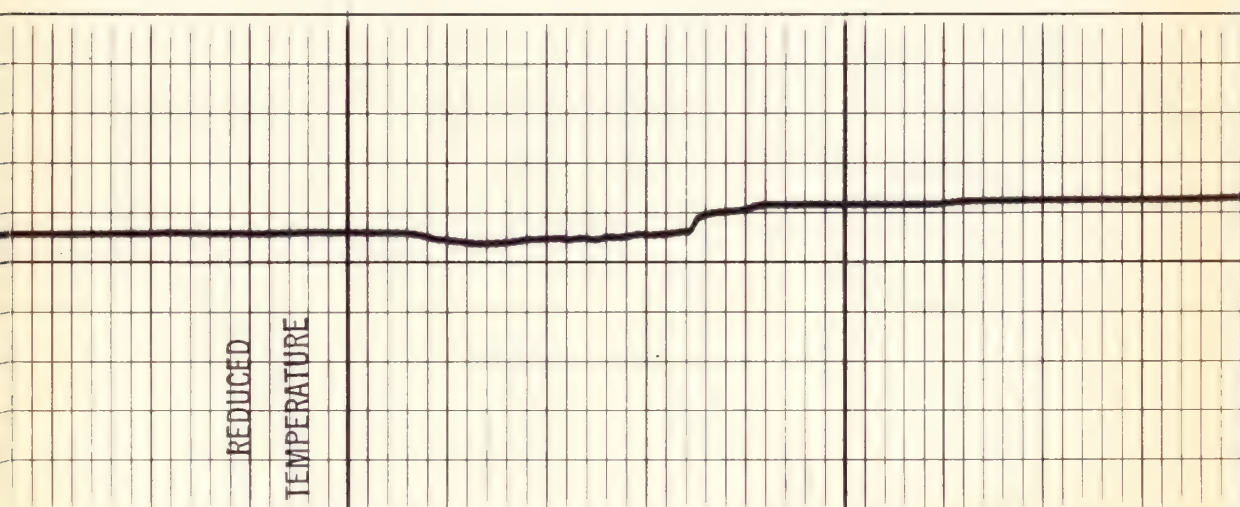
REDUCED SENSITIVITY
TEMPERATURE

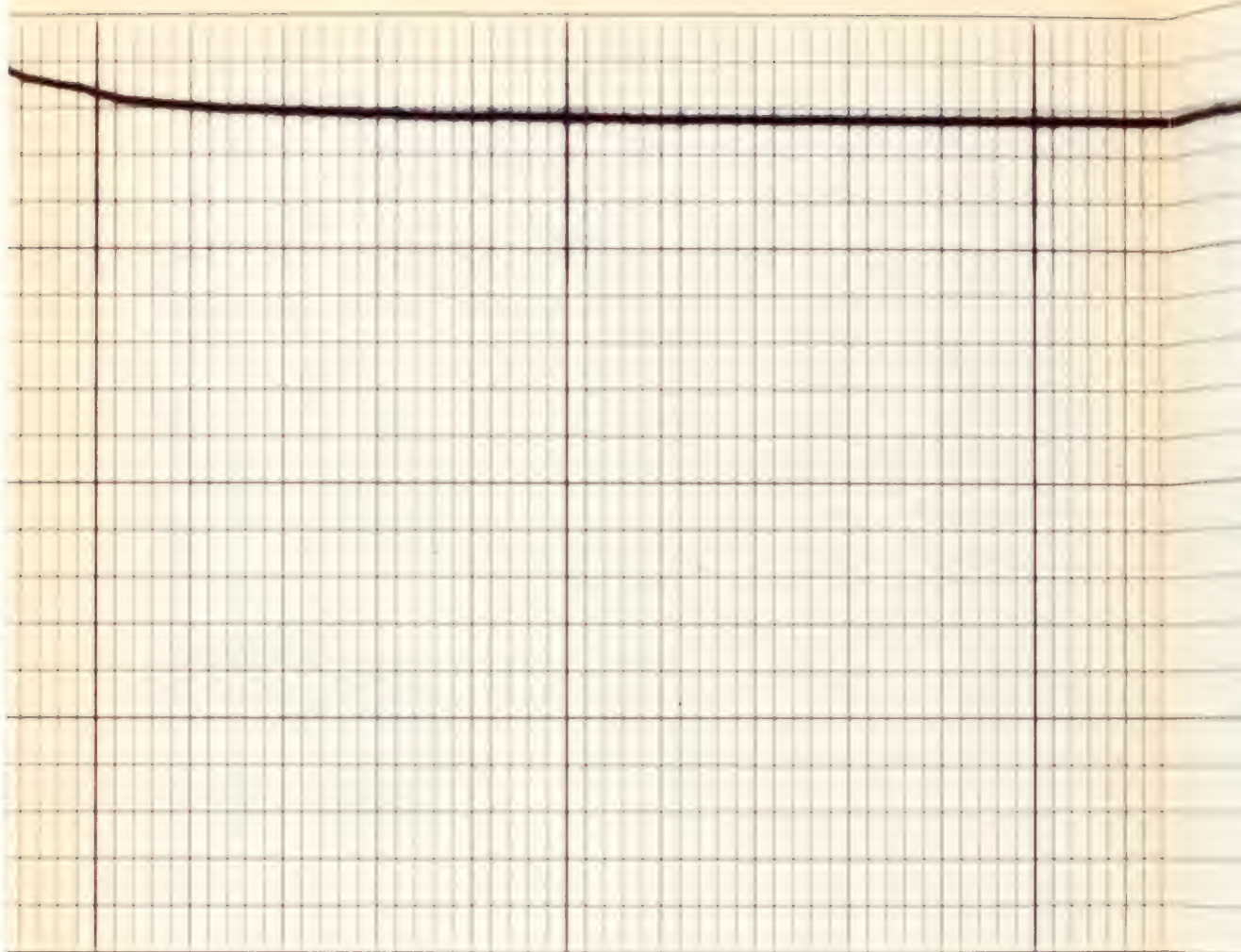
REDUCED SENSITIVITY
TEMPERATURE





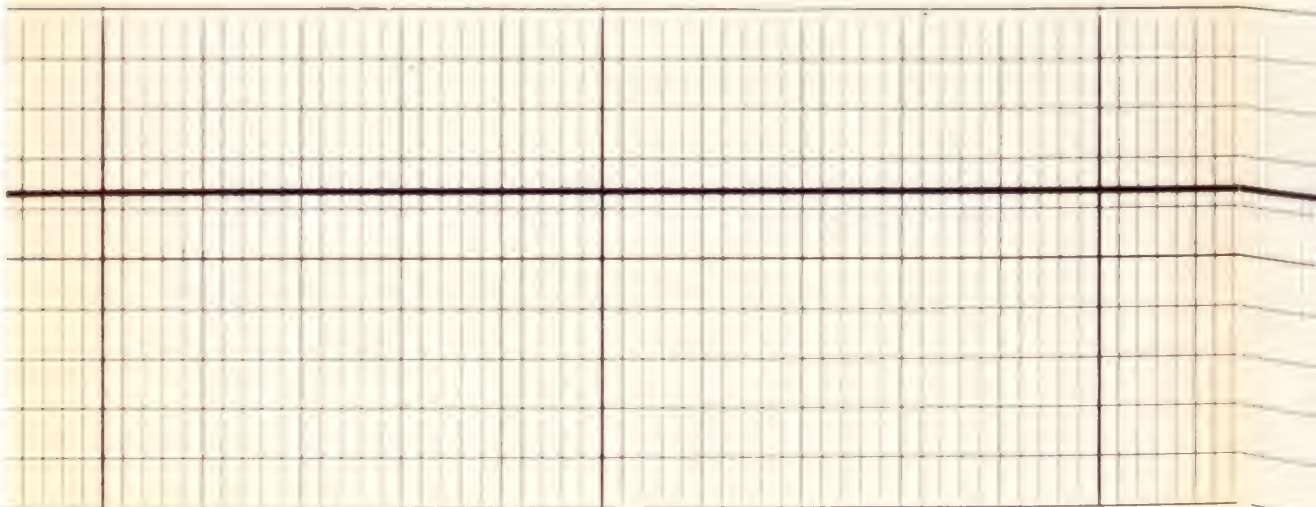
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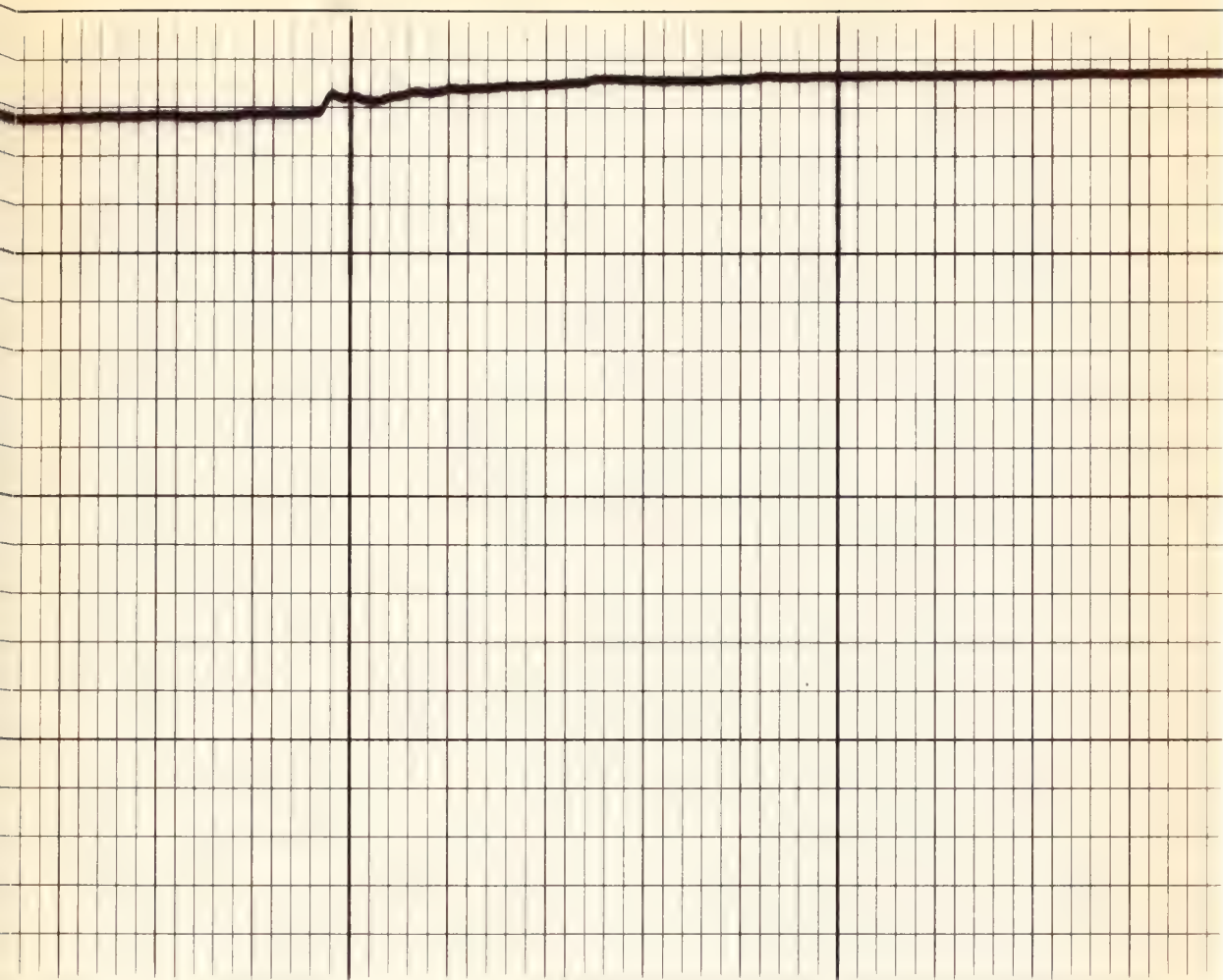




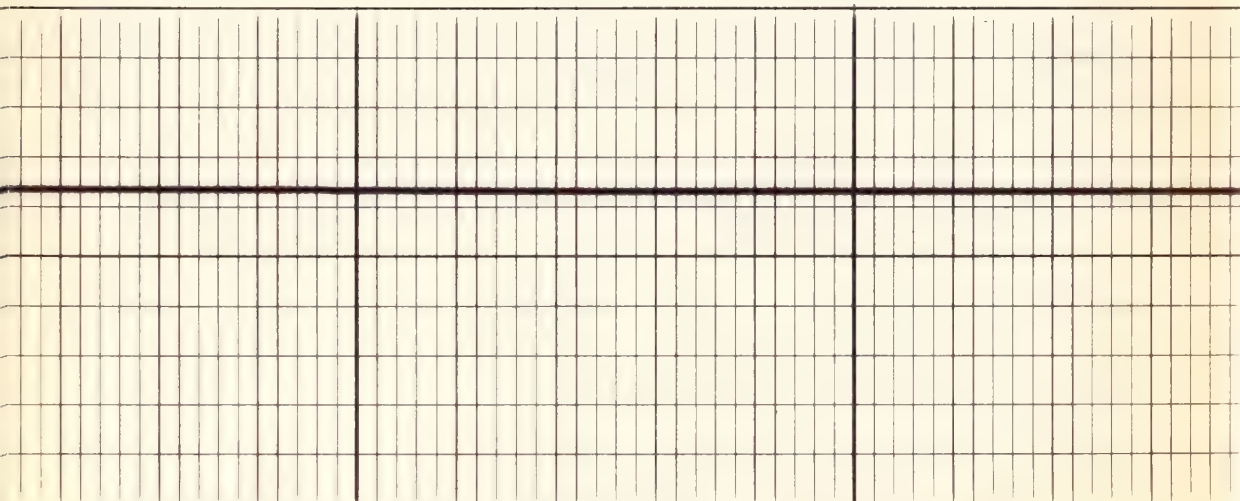
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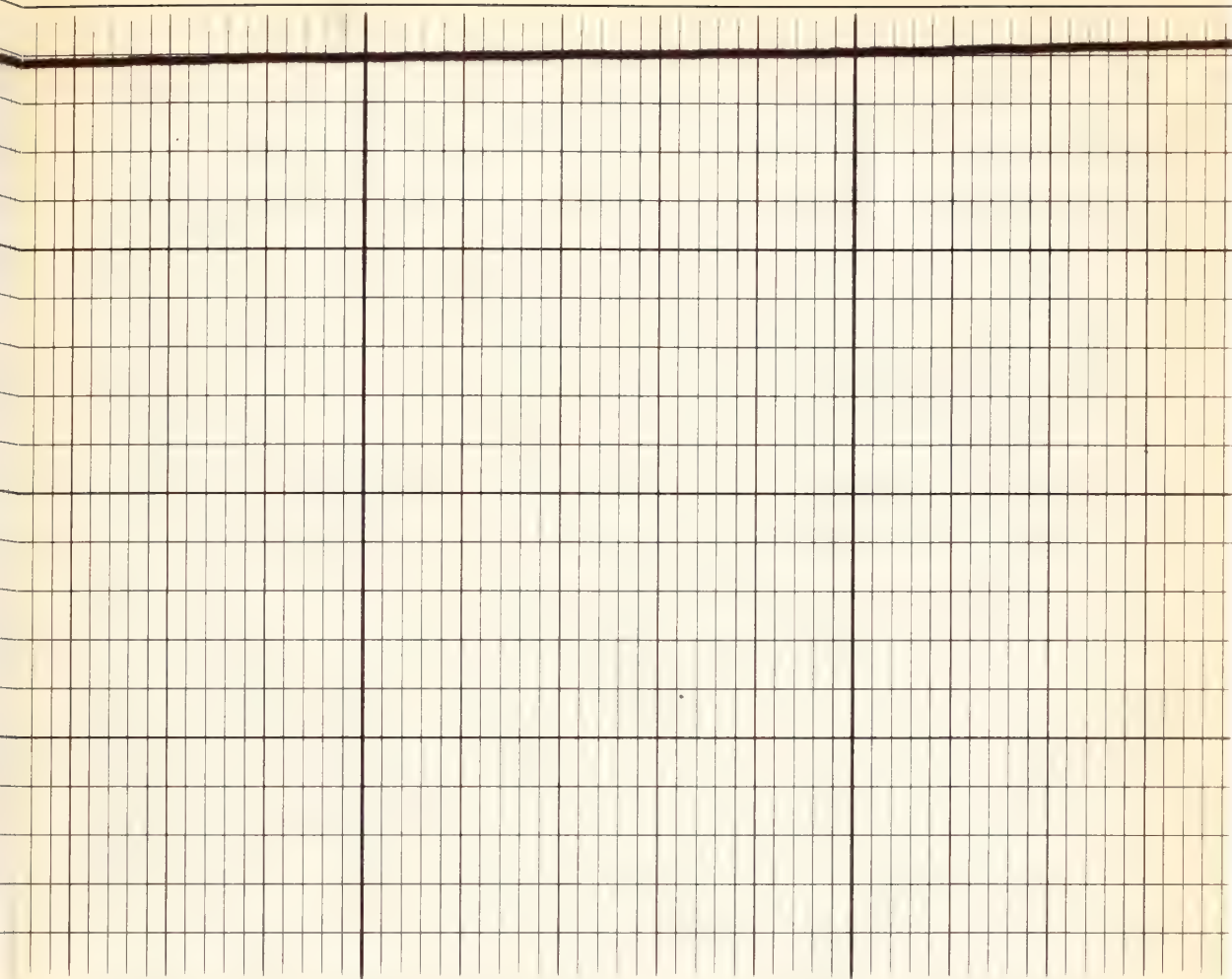




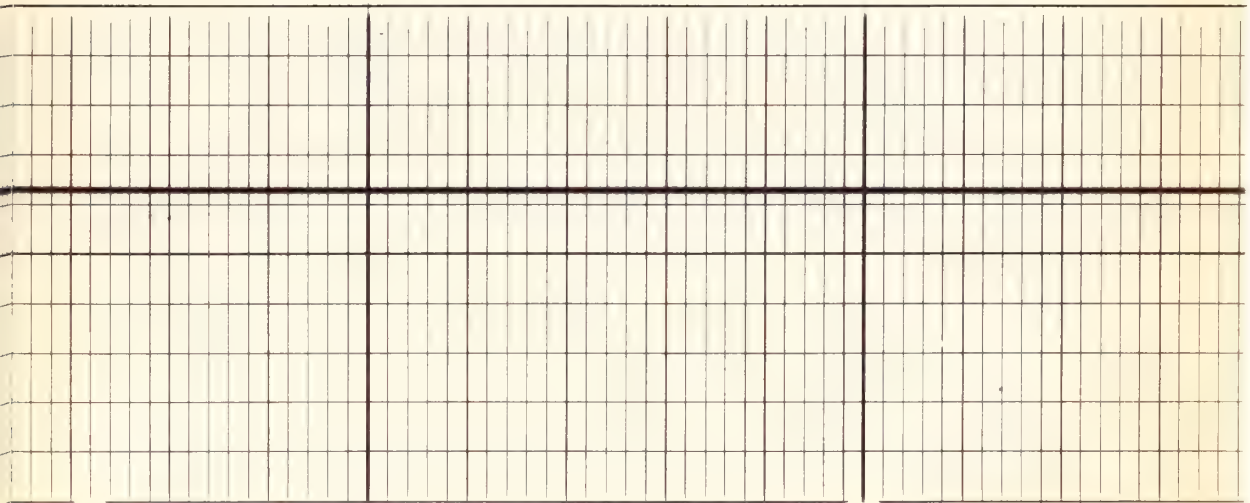
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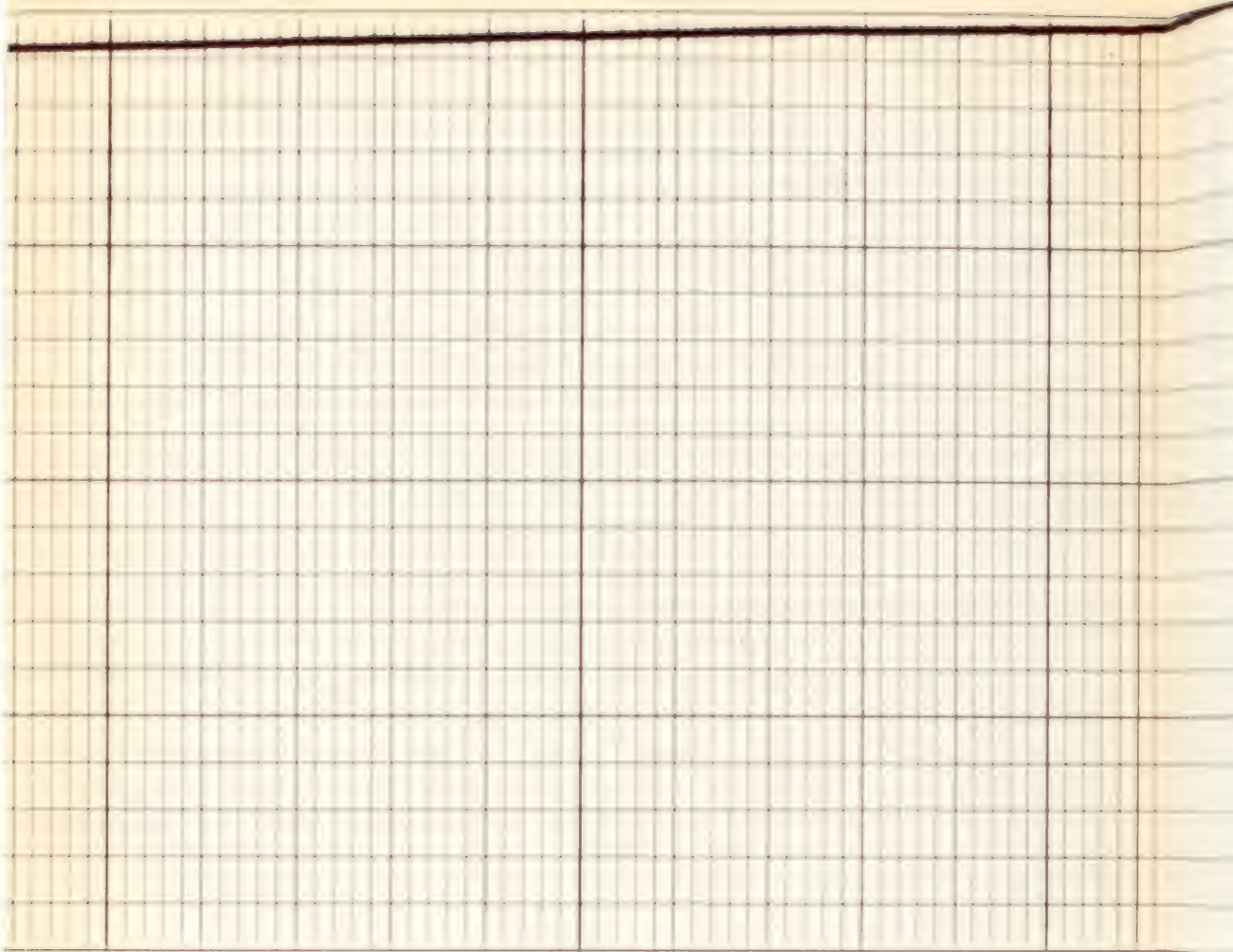


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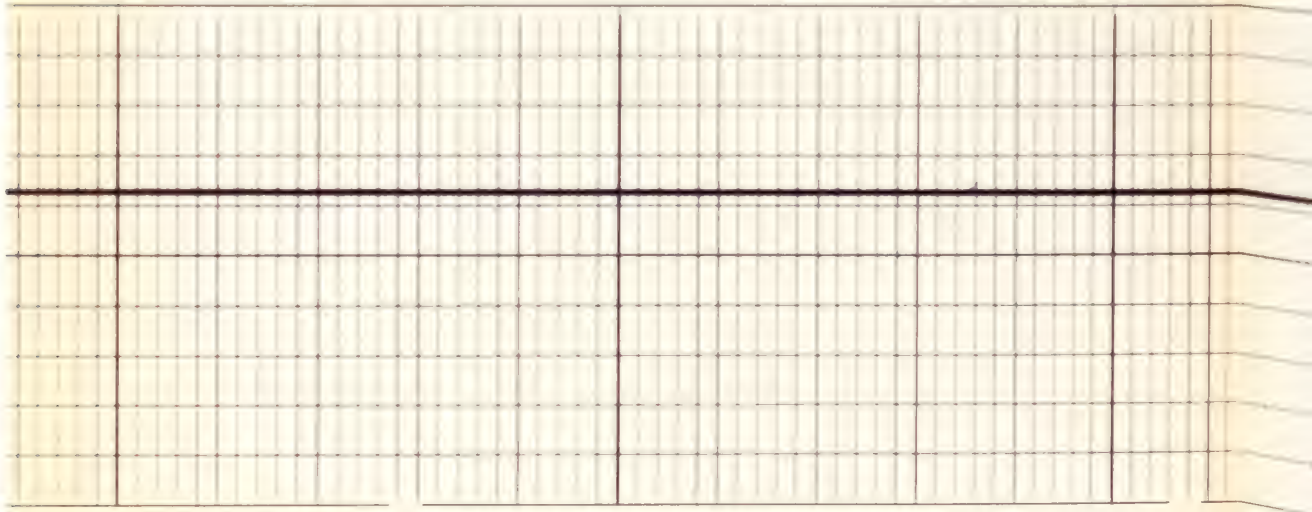
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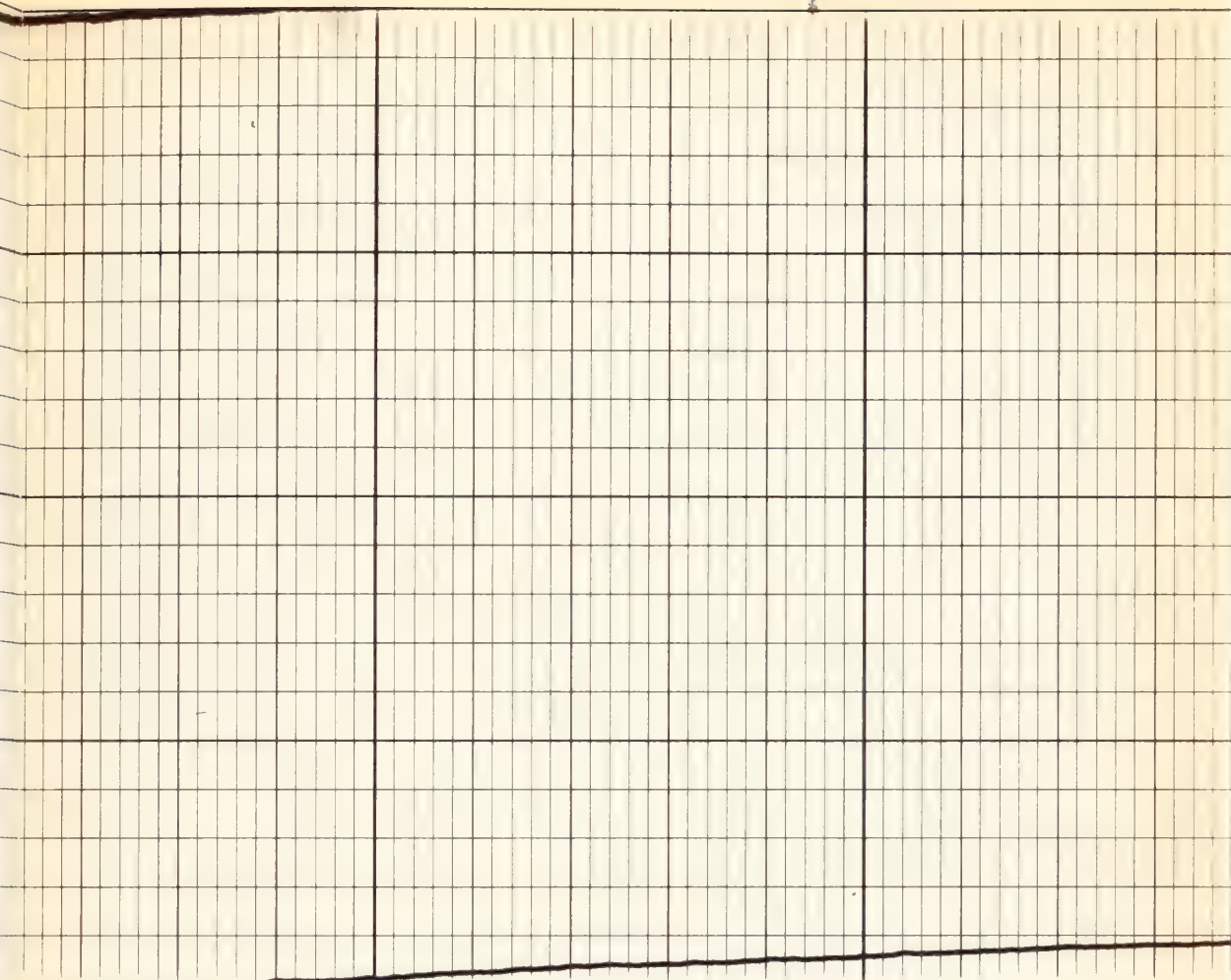




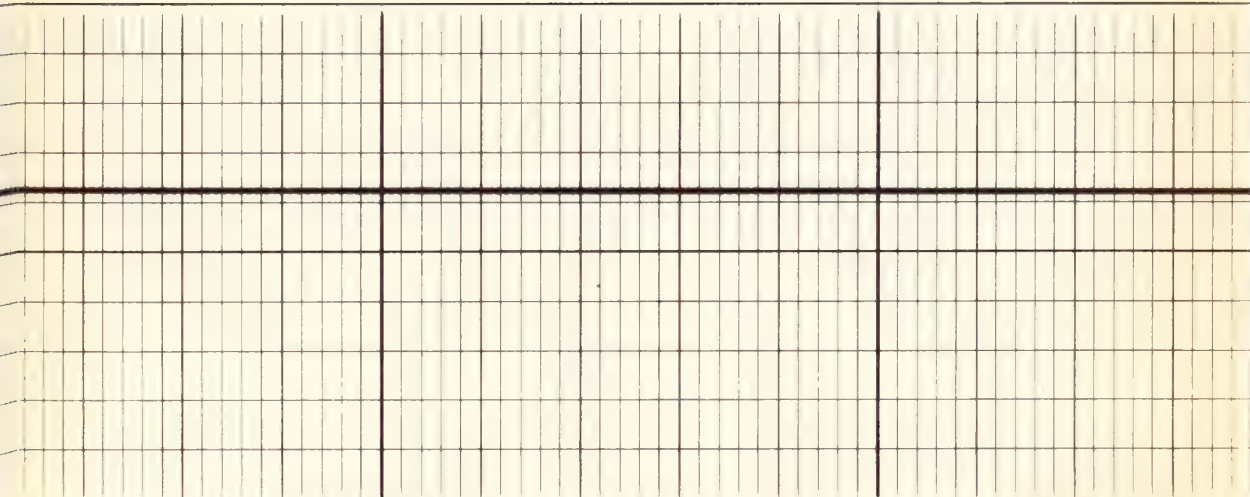
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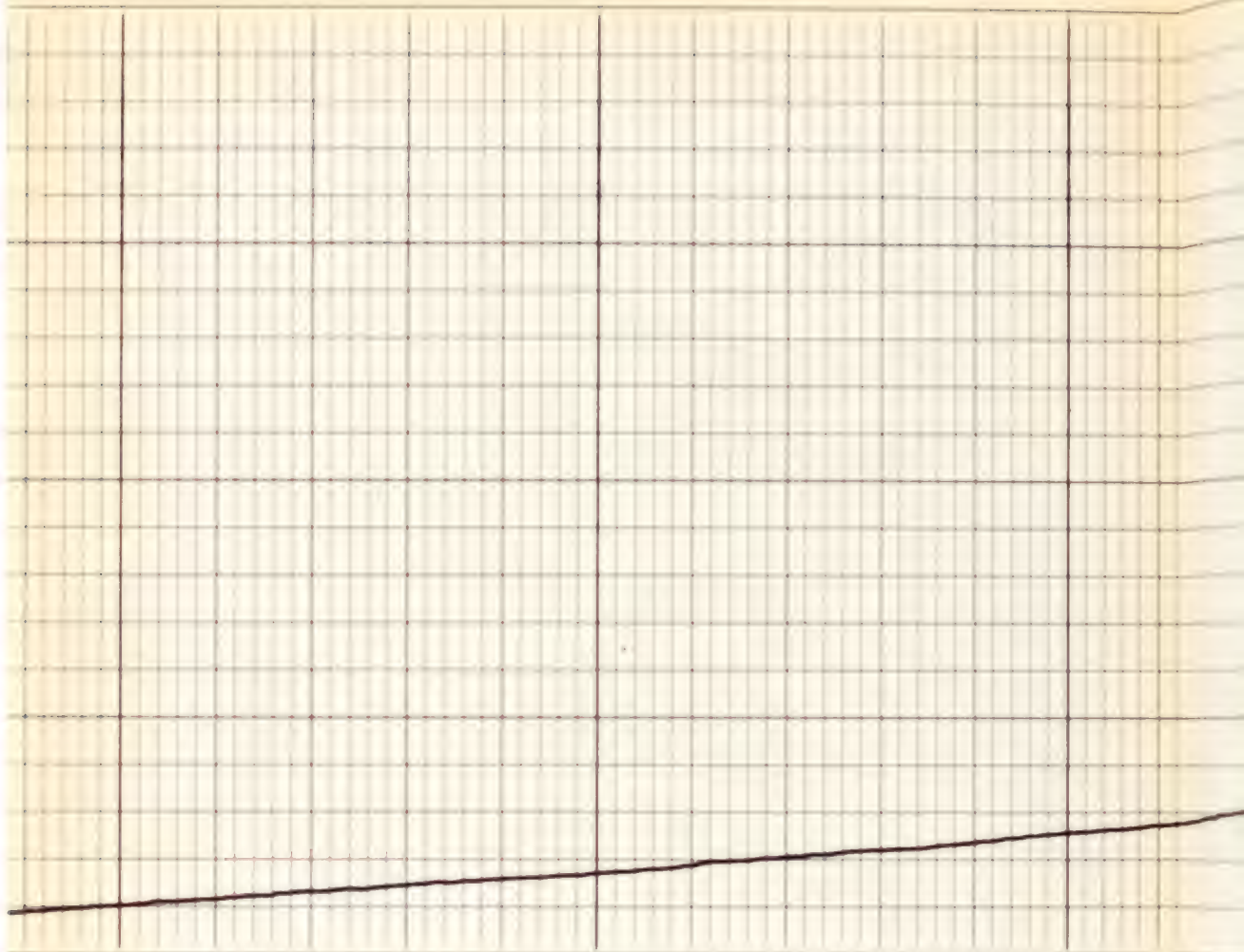
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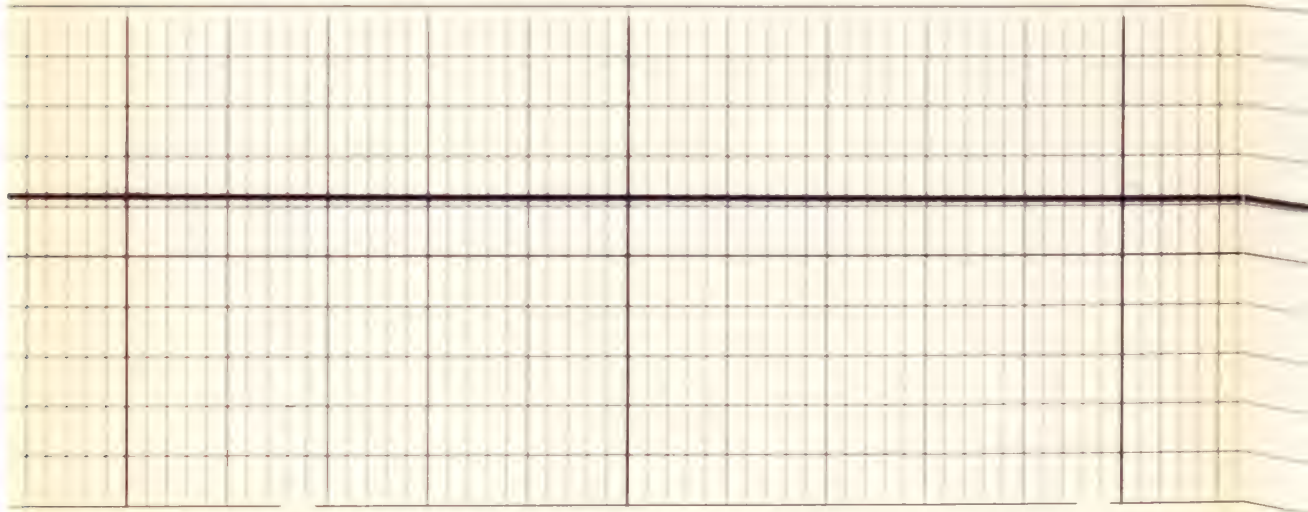


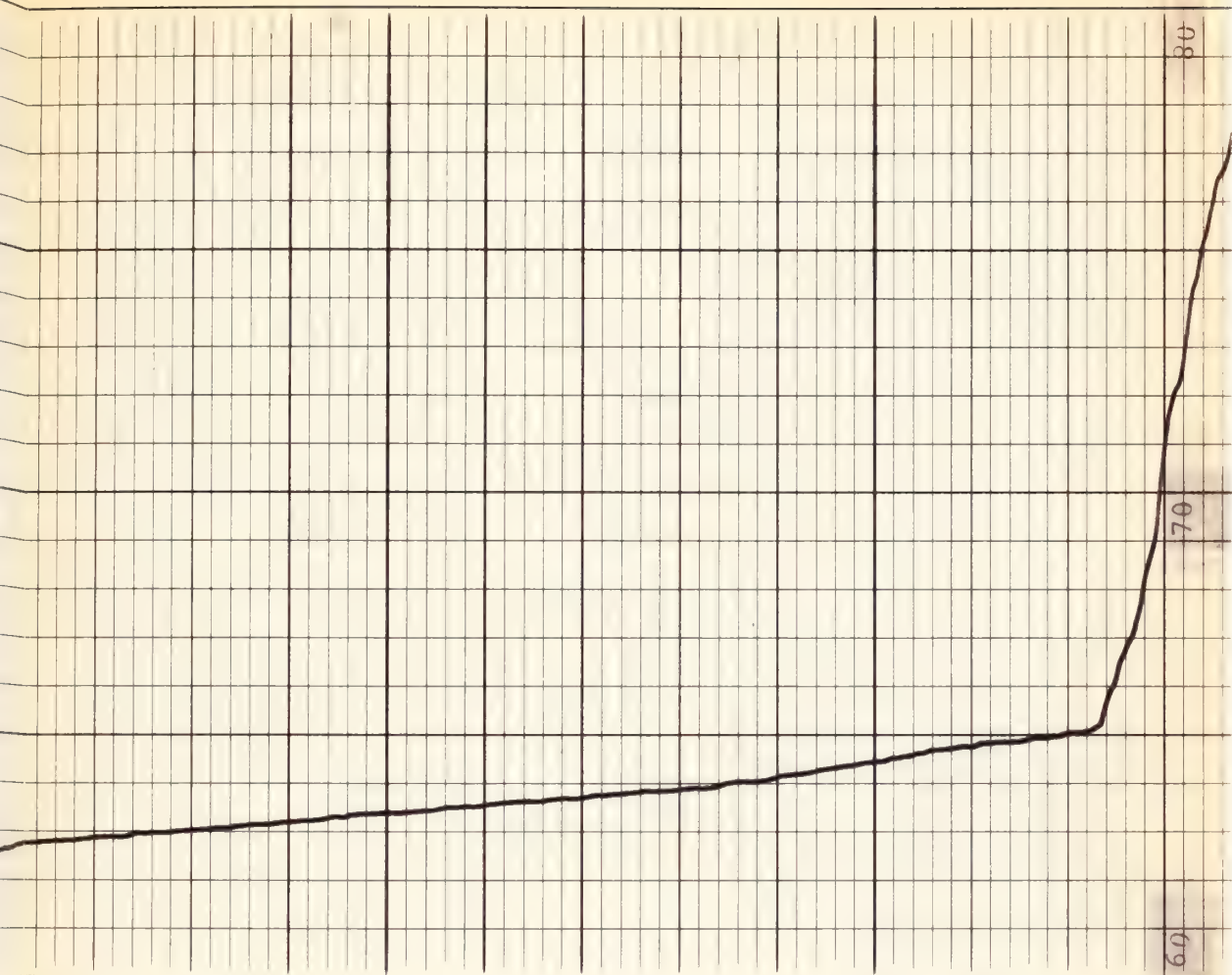
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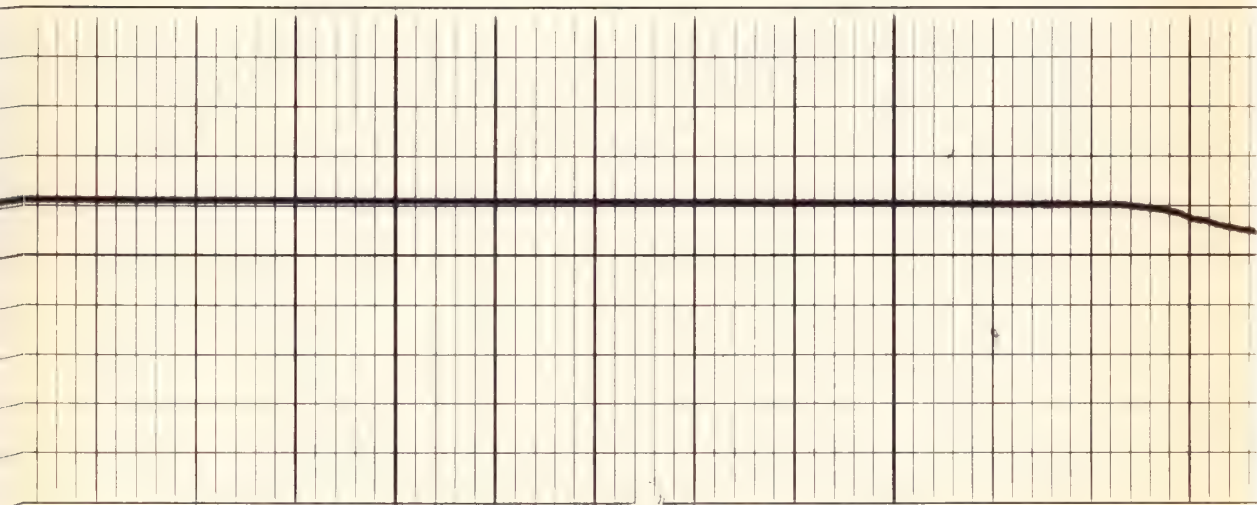


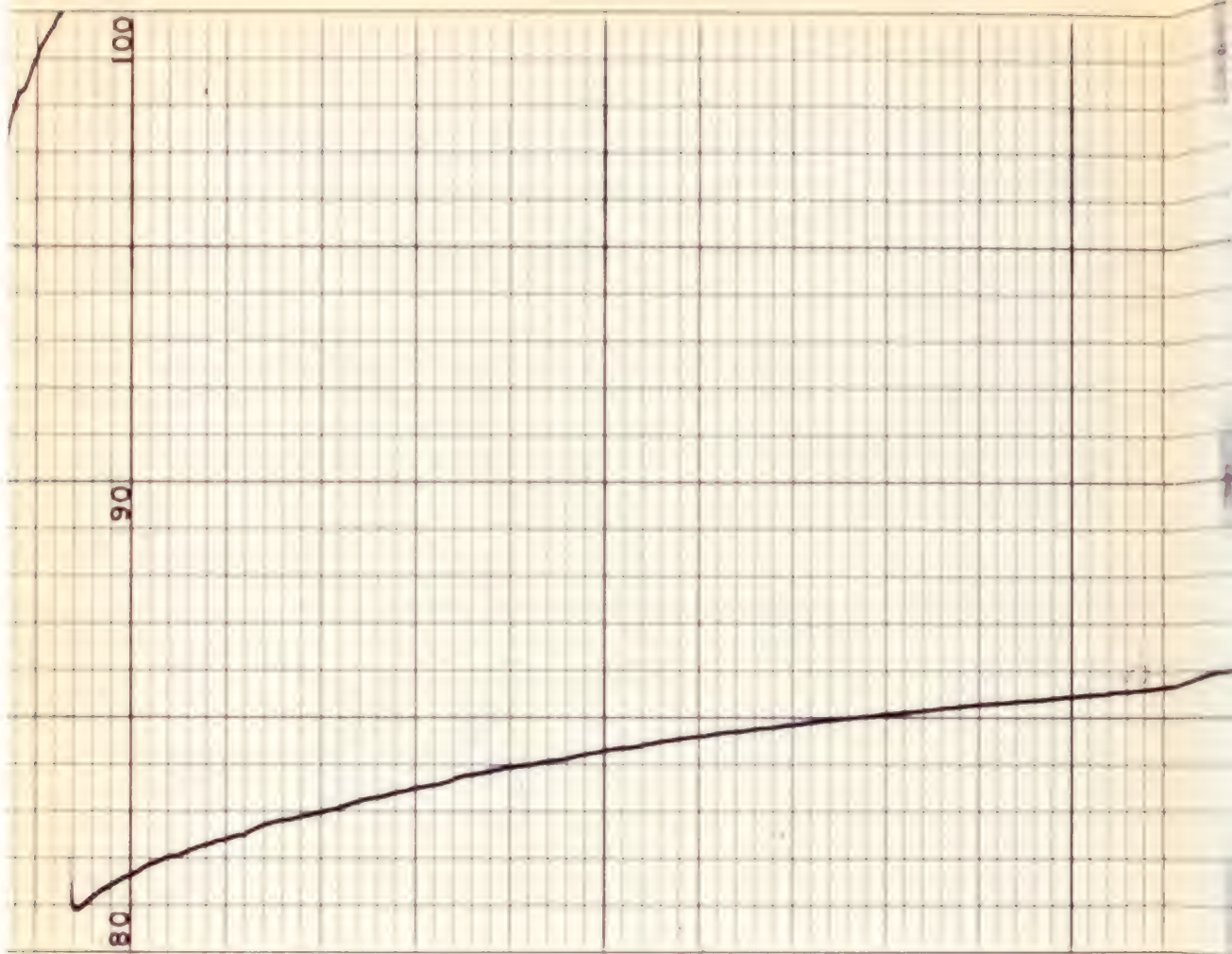
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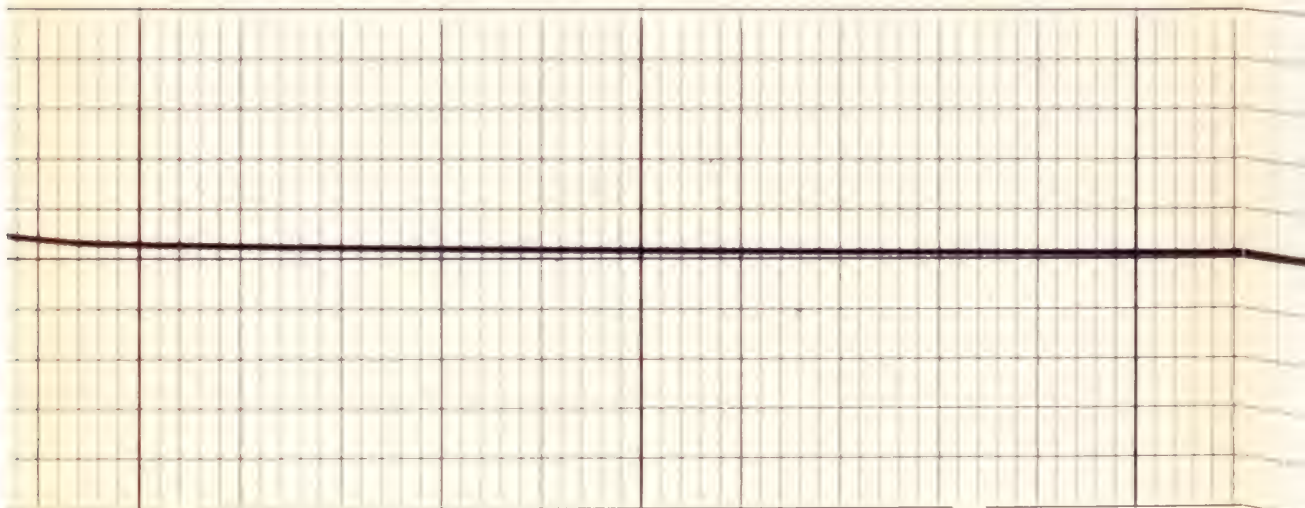
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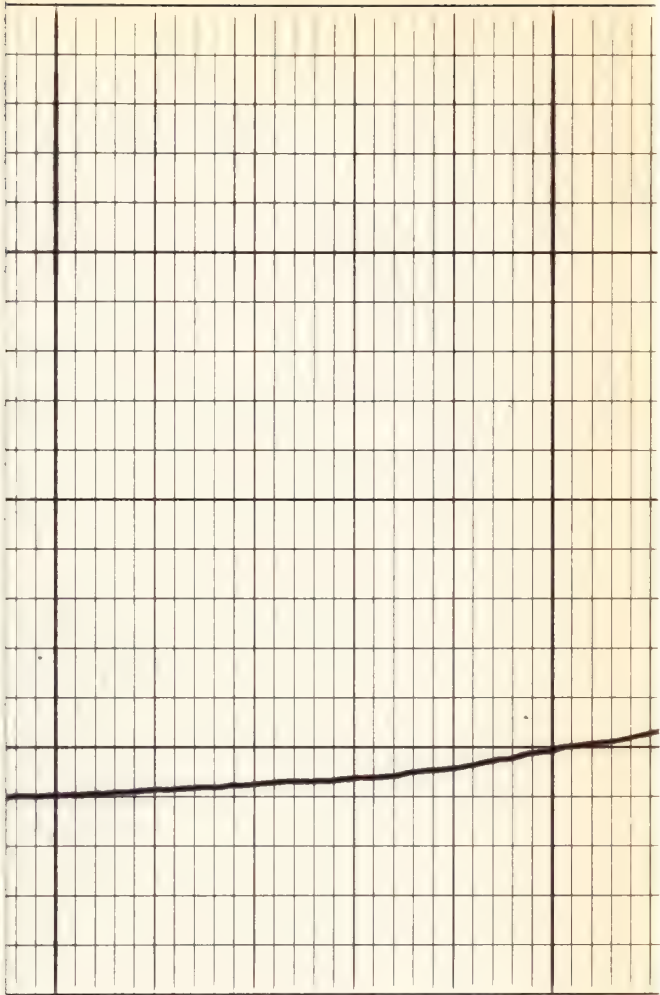
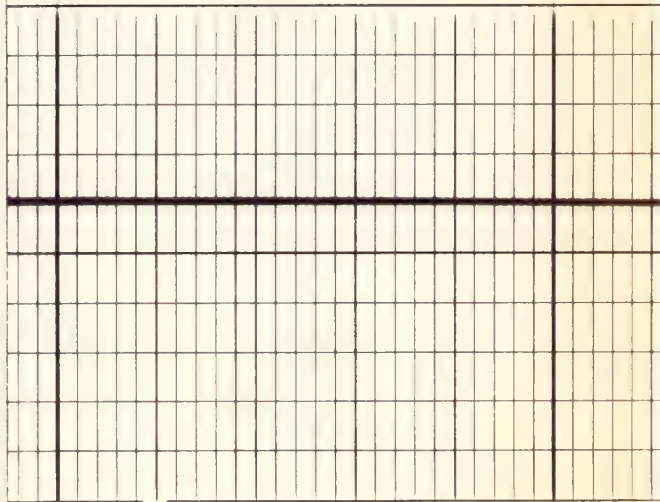
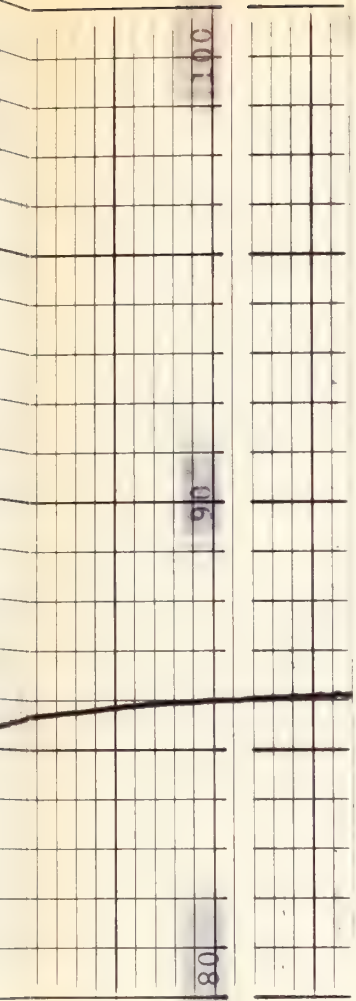
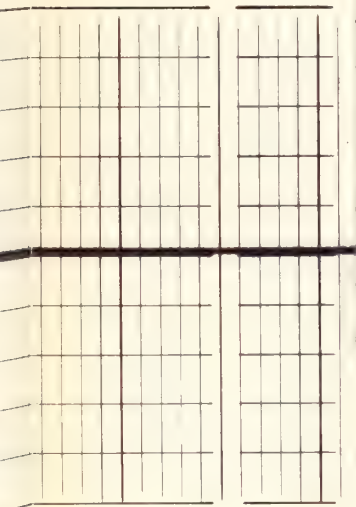


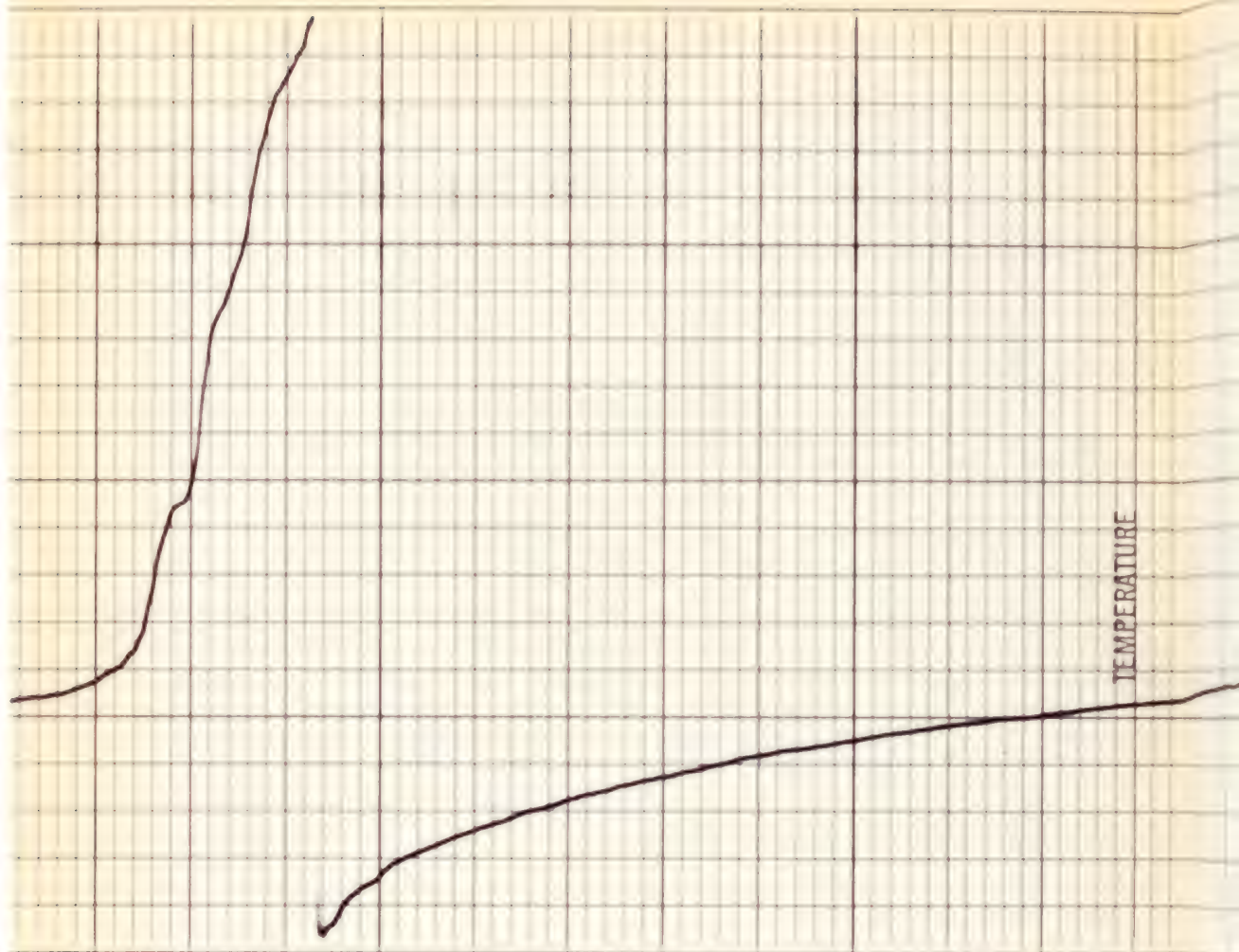


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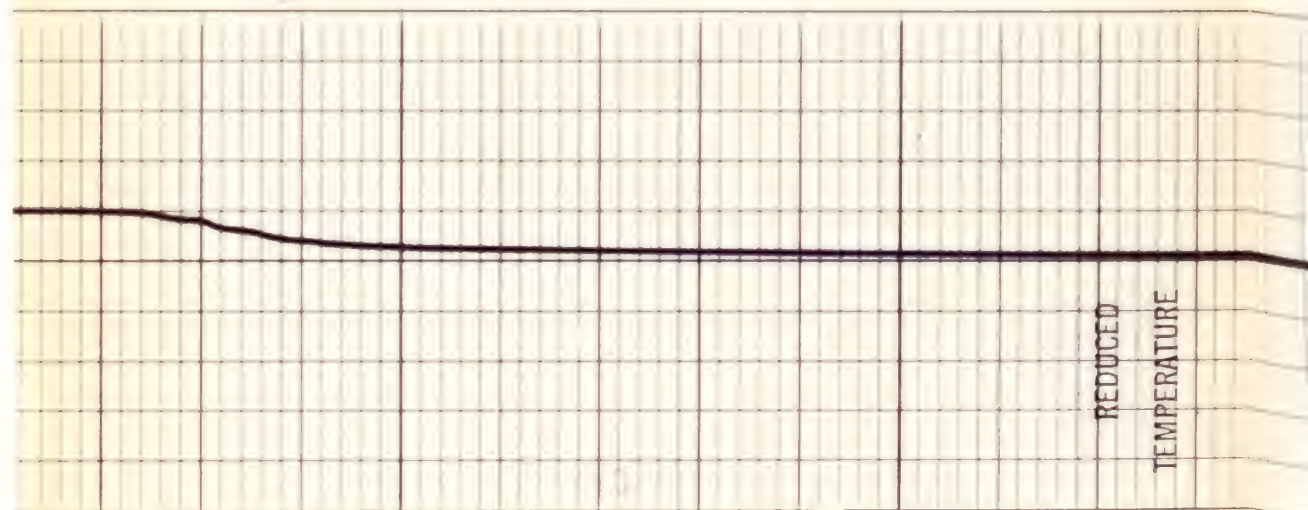
1600







1500



TEMPERATURE

TEMPERATURE

1600

INCREASES

INCREASES



TEMPERATURE ° F.

COMPANY

THE ATLANTIC RICHEFIELD COMPANY.

WELL

AQUIFER TEST #1-C

FIELD

SORGHUM GULCH

COUNTY

RIO BLANCO

STATE COLORADO

SCHL. F. R. 1646

SCHL. T. D. 1646

DRLR. T. D. 1640

| | | | | |
|------------------|--------------------|-------------|-------|-------|
| NAME | ADDRESS | CITY | STATE | ZIP |
| Mr. J. H. Smith | 123 Main St. | Springfield | Ill. | 62761 |
| Mr. W. R. Jones | 456 Oak Ave. | Chicago | Ill. | 60601 |
| Mr. T. L. Brown | 789 Elm St. | Peoria | Ill. | 61601 |
| Mr. S. K. Davis | 101 Maple Dr. | Rockford | Ill. | 61101 |
| Mr. P. M. Wilson | 202 Pine St. | Decatur | Ill. | 62521 |
| Mr. Q. N. Taylor | 303 Cedar Ave. | Normal | Ill. | 62451 |
| Mr. R. O. White | 404 Birch St. | Urbana | Ill. | 62501 |
| Mr. U. P. Green | 505 Walnut Dr. | Champaign | Ill. | 61821 |
| Mr. V. Q. Black | 606 Spruce St. | Carbondale | Ill. | 62901 |
| Mr. W. R. Gray | 707 Ash Ave. | Macomb | Ill. | 61451 |
| Mr. X. S. Hall | 808 Hickory St. | Shampaign | Ill. | 61881 |
| Mr. Y. T. King | 909 Poplar Dr. | Danvers | Ill. | 61831 |
| Mr. Z. U. Lee | 1010 Sycamore St. | Streator | Ill. | 61361 |
| Mr. A. V. Scott | 1111 Chestnut Ave. | Wilmington | Ill. | 62691 |
| Mr. B. W. Adams | 1212 Locust St. | Waukegan | Ill. | 60081 |
| Mr. C. X. Baker | 1313 Magnolia Dr. | Winnetka | Ill. | 60091 |
| Mr. D. Y. Carter | 1414 Myrtle St. | Wilmette | Ill. | 60091 |
| Mr. E. Z. Evans | 1515 North St. | Winthrop | Ill. | 60181 |
| Mr. F. A. Foster | 1616 Olive Ave. | Waukegan | Ill. | 60081 |
| Mr. G. B. Gibson | 1717 Palm St. | Winnetka | Ill. | 60091 |
| Mr. H. C. Hall | 1818 Pine Dr. | Wilmette | Ill. | 60091 |
| Mr. I. D. Harris | 1919 Spruce St. | Winthrop | Ill. | 60181 |
| Mr. J. E. Hill | 2020 Walnut Ave. | Waukegan | Ill. | 60081 |
| Mr. K. F. Jones | 2121 Cedar St. | Winnetka | Ill. | 60091 |
| Mr. L. G. King | 2222 Elm Dr. | Wilmette | Ill. | 60091 |
| Mr. M. H. Lee | 2323 Maple St. | Winthrop | Ill. | 60181 |
| Mr. N. I. Scott | 2424 Oak Ave. | Waukegan | Ill. | 60081 |
| Mr. O. J. Adams | 2525 Birch St. | Winnetka | Ill. | 60091 |
| Mr. P. K. Baker | 2626 Hickory Dr. | Wilmette | Ill. | 60091 |
| Mr. Q. L. Carter | 2727 Poplar St. | Winthrop | Ill. | 60181 |
| Mr. R. M. Evans | 2828 Sycamore Ave. | Waukegan | Ill. | 60081 |
| Mr. S. N. Foster | 2929 Chestnut St. | Winnetka | Ill. | 60091 |
| Mr. T. O. Gibson | 3030 Locust Dr. | Wilmette | Ill. | 60091 |
| Mr. U. P. Hall | 3131 Magnolia St. | Winthrop | Ill. | 60181 |
| Mr. V. Q. Hill | 3232 Myrtle Ave. | Waukegan | Ill. | 60081 |
| Mr. W. R. King | 3333 North St. | Winnetka | Ill. | 60091 |
| Mr. X. S. Lee | 3434 Olive St. | Wilmette | Ill. | 60091 |
| Mr. Y. T. Scott | 3535 Palm Dr. | Winthrop | Ill. | 60181 |
| Mr. Z. U. Adams | 3636 Pine Ave. | Waukegan | Ill. | 60081 |
| Mr. A. V. Baker | 3737 Spruce St. | Winnetka | Ill. | 60091 |
| Mr. B. W. Carter | 3838 Walnut Dr. | Wilmette | Ill. | 60091 |
| Mr. C. X. Evans | 3939 Cedar St. | Winthrop | Ill. | 60181 |
| Mr. D. Y. Foster | 4040 Elm Ave. | Waukegan | Ill. | 60081 |
| Mr. E. Z. Gibson | 4141 Maple St. | Winnetka | Ill. | 60091 |
| Mr. F. A. Hall | 4242 Oak Dr. | Wilmette | Ill. | 60091 |
| Mr. G. B. Hill | 4343 Birch St. | Winthrop | Ill. | 60181 |
| Mr. H. C. King | 4444 Hickory Ave. | Waukegan | Ill. | 60081 |
| Mr. I. D. Lee | 4545 Poplar St. | Winnetka | Ill. | 60091 |
| Mr. J. E. Scott | 4646 Sycamore Dr. | Wilmette | Ill. | 60091 |
| Mr. K. F. Adams | 4747 Chestnut St. | Winthrop | Ill. | 60181 |
| Mr. L. G. Baker | 4848 Locust Ave. | Waukegan | Ill. | 60081 |
| Mr. M. H. Carter | 4949 Magnolia St. | Winnetka | Ill. | 60091 |
| Mr. N. I. Evans | 5050 Myrtle Dr. | Wilmette | Ill. | 60091 |
| Mr. O. J. Foster | 5151 North St. | Winthrop | Ill. | 60181 |
| Mr. P. K. Gibson | 5252 Olive Ave. | Waukegan | Ill. | 60081 |
| Mr. Q. L. Hall | 5353 Palm St. | Winnetka | Ill. | 60091 |
| Mr. R. M. Hill | 5454 Pine Dr. | Wilmette | Ill. | 60091 |
| Mr. S. N. King | 5555 Spruce St. | Winthrop | Ill. | 60181 |
| Mr. T. O. Lee | 5656 Walnut Ave. | Waukegan | Ill. | 60081 |
| Mr. U. P. Scott | 5757 Cedar St. | Winnetka | Ill. | 60091 |
| Mr. V. Q. Adams | 5858 Elm Dr. | Wilmette | Ill. | 60091 |
| Mr. W. R. Baker | 5959 Maple St. | Winthrop | Ill. | 60181 |
| Mr. X. S. Carter | 6060 Oak Ave. | Waukegan | Ill. | 60081 |
| Mr. Y. T. Evans | 6161 Birch St. | Winnetka | Ill. | 60091 |
| Mr. Z. U. Foster | 6262 Hickory Dr. | Wilmette | Ill. | 60091 |
| Mr. A. V. Gibson | 6363 Poplar St. | Winthrop | Ill. | 60181 |
| Mr. B. W. Hall | 6464 Sycamore Ave. | Waukegan | Ill. | 60081 |
| Mr. C. X. Hill | 6565 Chestnut St. | Winnetka | Ill. | 60091 |
| Mr. D. Y. King | 6666 Locust Dr. | Wilmette | Ill. | 60091 |
| Mr. E. Z. Lee | 6767 Magnolia St. | Winthrop | Ill. | 60181 |
| Mr. F. A. Scott | 6868 Myrtle Ave. | Waukegan | Ill. | 60081 |
| Mr. G. B. Adams | 6969 North St. | Winnetka | Ill. | 60091 |
| Mr. H. C. Baker | 7070 Olive St. | Wilmette | Ill. | 60091 |
| Mr. I. D. Carter | 7171 Palm Dr. | Winthrop | Ill. | 60181 |
| Mr. J. E. Evans | 7272 Pine Ave. | Waukegan | Ill. | 60081 |
| Mr. K. F. Foster | 7373 Spruce St. | Winnetka | Ill. | 60091 |
| Mr. L. G. Gibson | 7474 Walnut Dr. | Wilmette | Ill. | 60091 |
| Mr. M. H. Hall | 7575 Cedar St. | Winthrop | Ill. | 60181 |

Schlumberger

BOREHOLE COMPENSATED
SONIC LOG - GAMMA RAY

(WITH CALIPER)

COUNTY RIO BLANCO

FIELD or

LOCATION SORGHUM GULCH

WELL

AT-1C

COMPANY ATLANTIC RICHFIELD

COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL AT-1C

FIELD SORGHUM GULCH

COUNTY RIO BLANCO STATE COLORADO

Location: API Serial No. 15129

Other Services:

Sec. 7 Twp. 3S Rge. 96W

Permanent Datum: GROUND LEVEL; Elev.: 6909
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6909

| | | | | | |
|--------------------|-----------------|-------------|-------|------|------|
| Date | 9-11-74 | | | | |
| Run No. | ONE | | | | |
| Depth-Driller | 1640 | | | | |
| Depth-Logger | 1646 | | | | |
| Btm. Log Interval | 1638 | | | | |
| Top Log Interval | 468 | | | | |
| Casing-Driller | 8 5/8 @ 59 | @ | @ | @ | @ |
| Casing-Logger | ---- | | | | |
| Bit Size | 7 7/8 | | | | |
| Type Fluid in Hole | WATER | | | | |
| Fluid Level | 436 | | | | |
| Dens. | Visc. | -- | -- | | |
| pH | Fluid Loss | -- | -- ml | ml | ml |
| Source of Sample | ---- | | | | |
| Rm @ Meas. Temp. | -- @ --°F | @ °F | @ °F | @ °F | @ °F |
| Rmf @ Meas. Temp. | -- @ --°F | @ °F | @ °F | @ °F | @ °F |
| Rmc @ Meas. Temp. | -- @ --°F | @ °F | @ °F | @ °F | @ °F |
| Source: Rmf | Rmc | -- | -- | | |
| Rm @ BHT | -- @ --°F | @ °F | @ °F | @ °F | @ °F |
| Time Since Circ. | ---- | | | | |
| Max. Rec. Temp. | ---- °F | °F | °F | °F | °F |
| Equip. | Location | 3802 VERNAL | | | |
| Recorded By | MARTIN-ST. AUDY | | | | |
| Witnessed By | MR. ROSS | | | | |

II - Location and borehole reference data were furnished by the customer.

FOLD HERE

LINE WELL NAME, LOCATION AND BOREHOLE IDENTIFICATION DATA WITH COMMENTS (SEE REVERSE SIDE)

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

SCALE CHANGES

| Date | Sample No. | | | Type Log | Depth | Scale Up Hole | Scale Down Hole |
|---------------------|------------|----|-----|----------|-------|---------------|-----------------|
| Depth - Driller | | | | | | | |
| Type Fluid in Hole | | | | | | | |
| Dens. | Visc. | | | | | | |
| ph | Fluid Loss | ml | | | | | |
| Source of Sample | | | | | | | |
| Rm (a) Meas. Temp. | | F | (a) | | | | |
| Rmf (a) Meas. Temp. | | F | (a) | | | | |
| Rmc (a) Meas. Temp. | | F | (a) | | | | |
| Source: Rmf | Rmc | | | | | | |
| Rm (a) BHT | | F | (a) | | | | |
| Rmf (a) BHT | | F | (a) | | | | |
| Rmc (a) BHT | | F | (a) | | | | |

EQUIPMENT DATA

REMARKS

Service Order No. -

Run No. ONE

Sonic Panel No. SLP-439

Sonic Cart No. SH-C-189

Sonic Sonde No. SLB-011-437

Mem. Panel No. ---

G.R. Cart No. ---

G.R. Panel No. ---

Caliper No. ---

TTR No. ---

Cent. Device RUBBER

Stand off - Inches 7 3/4

Time Const. - Sec. ---

Speed - F.P.M. 30 FPM

CALIBRATION DATA

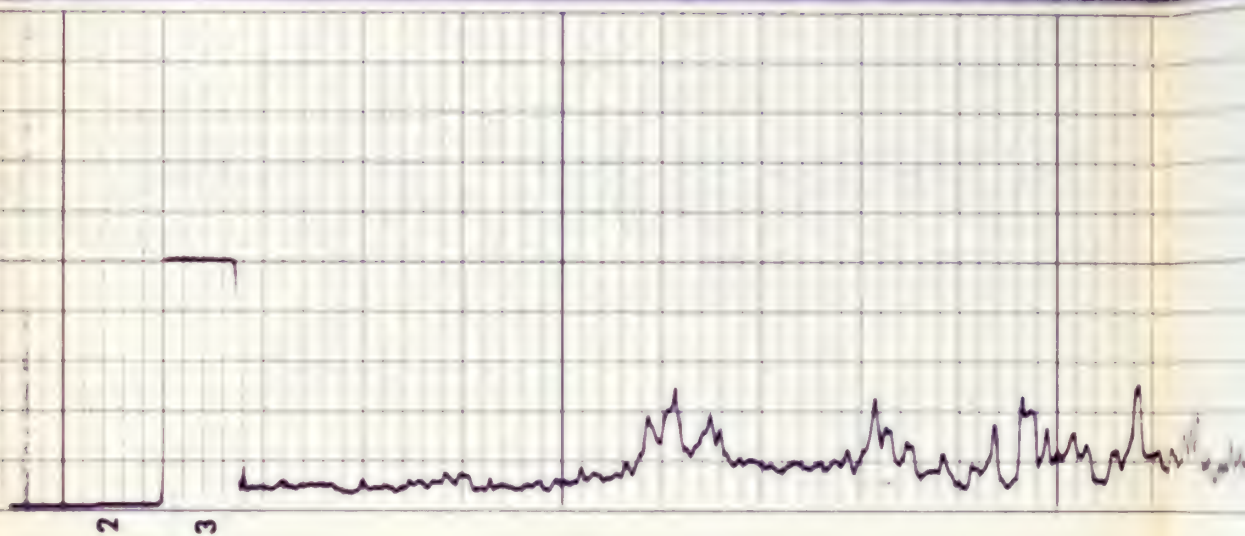
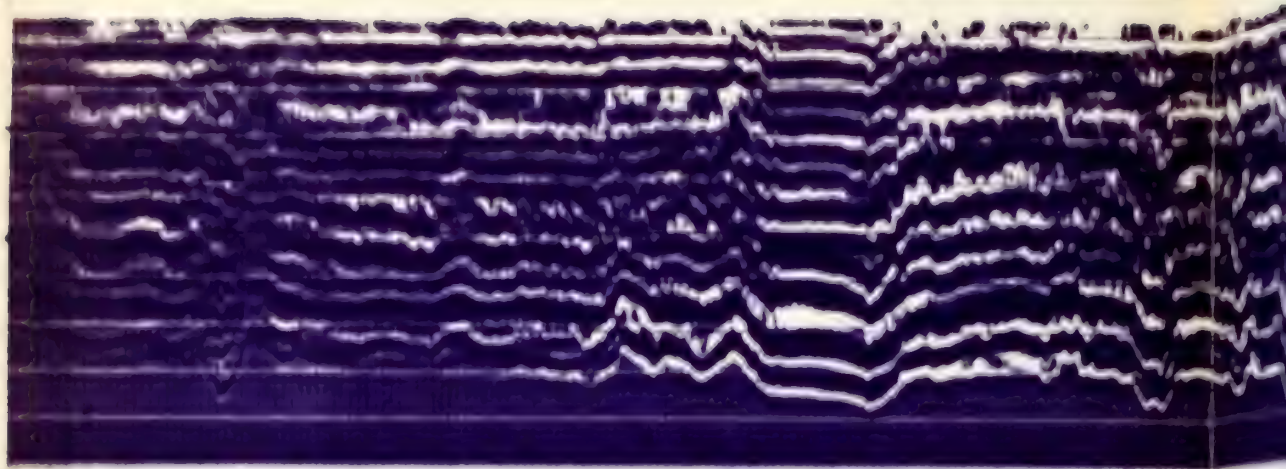
CALIBRATION DATE: _____

DATE OF TEST: _____

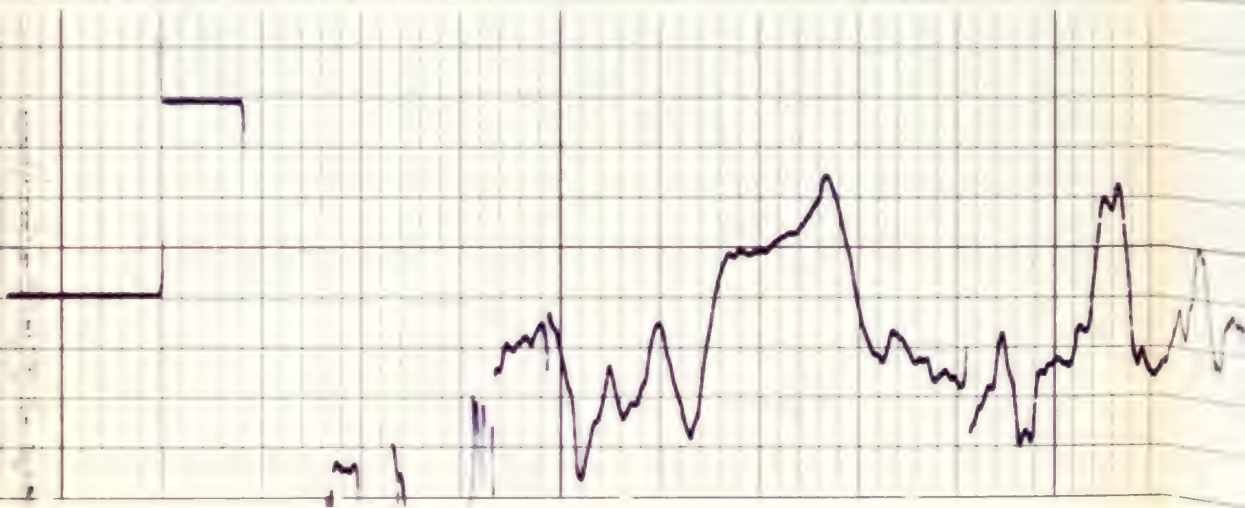
COPIES: _____

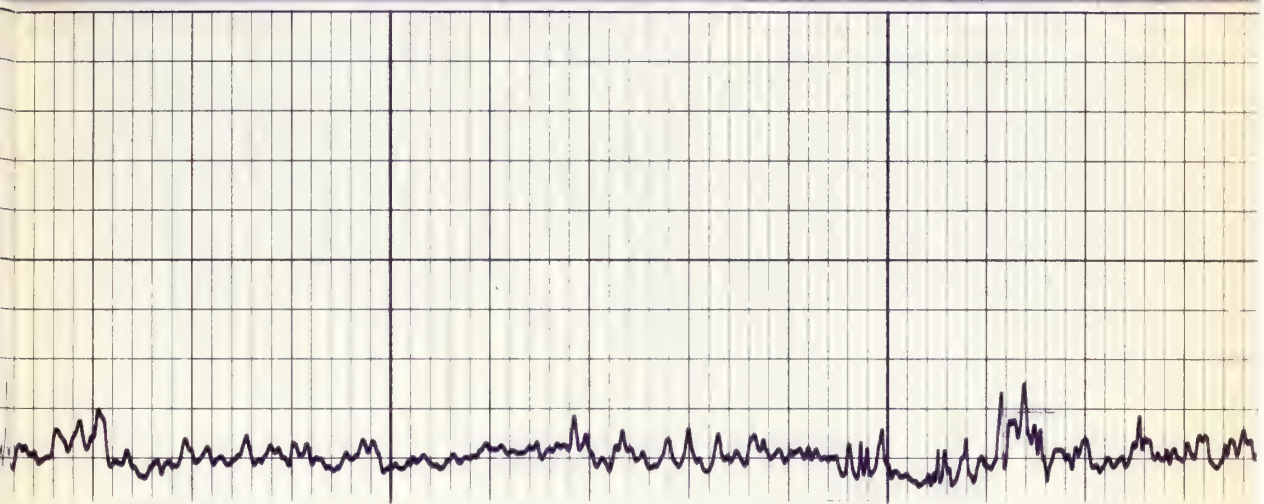
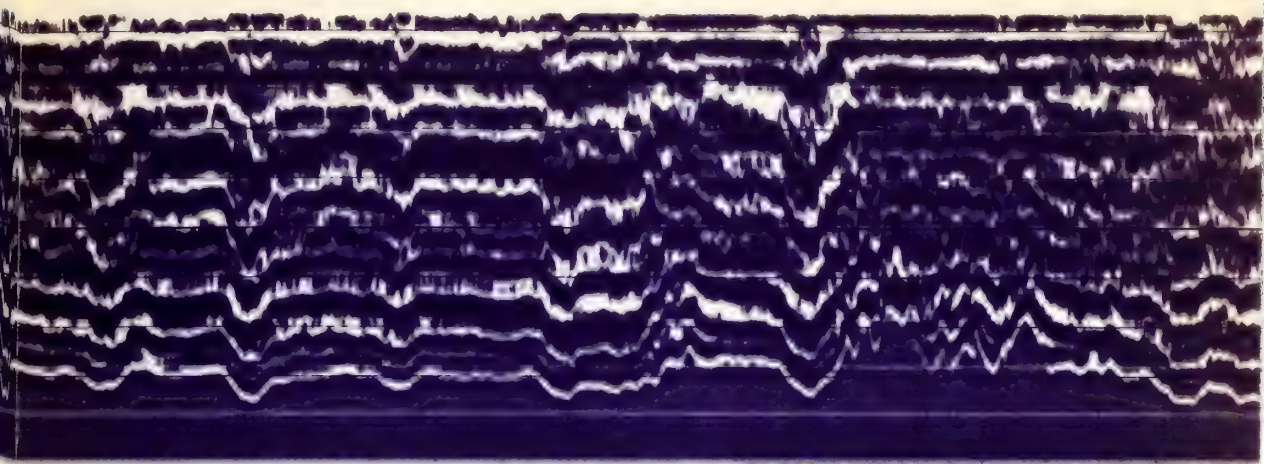
DATE: _____

TIME: _____

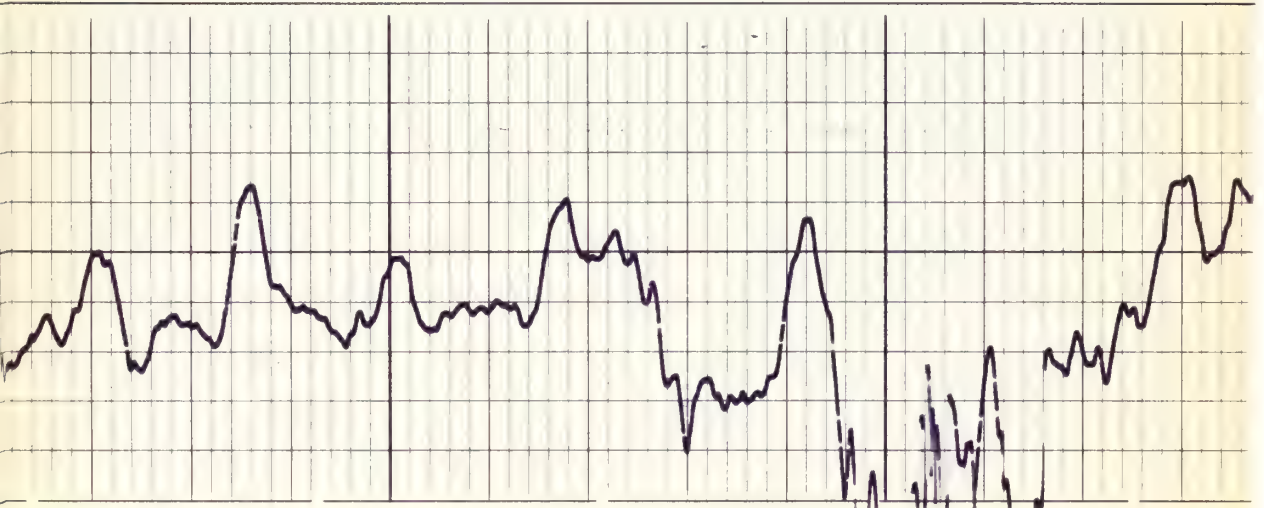


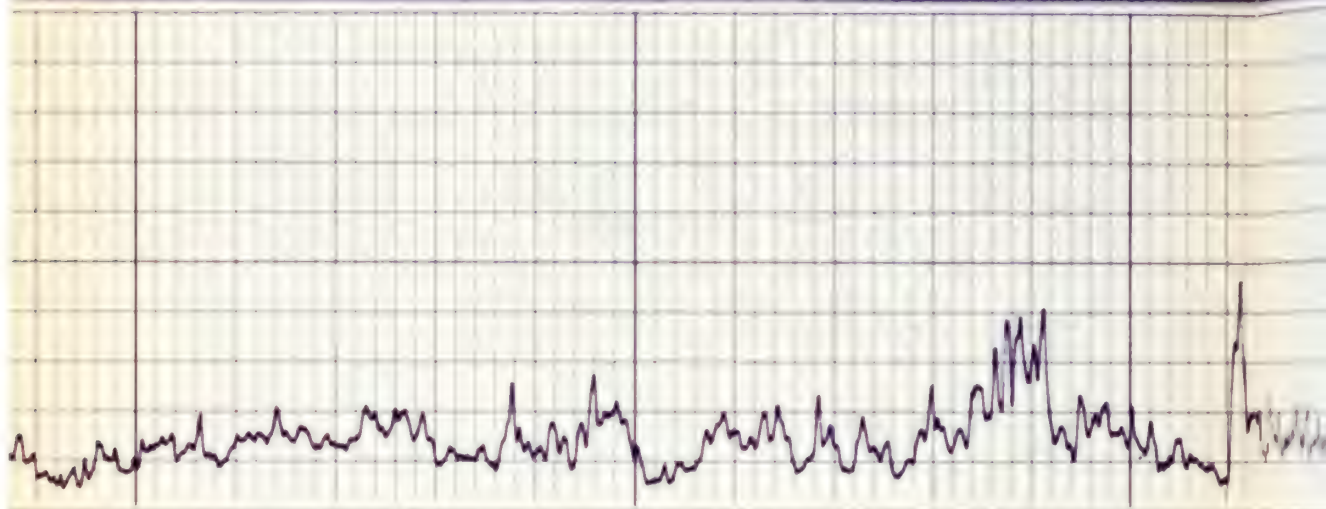
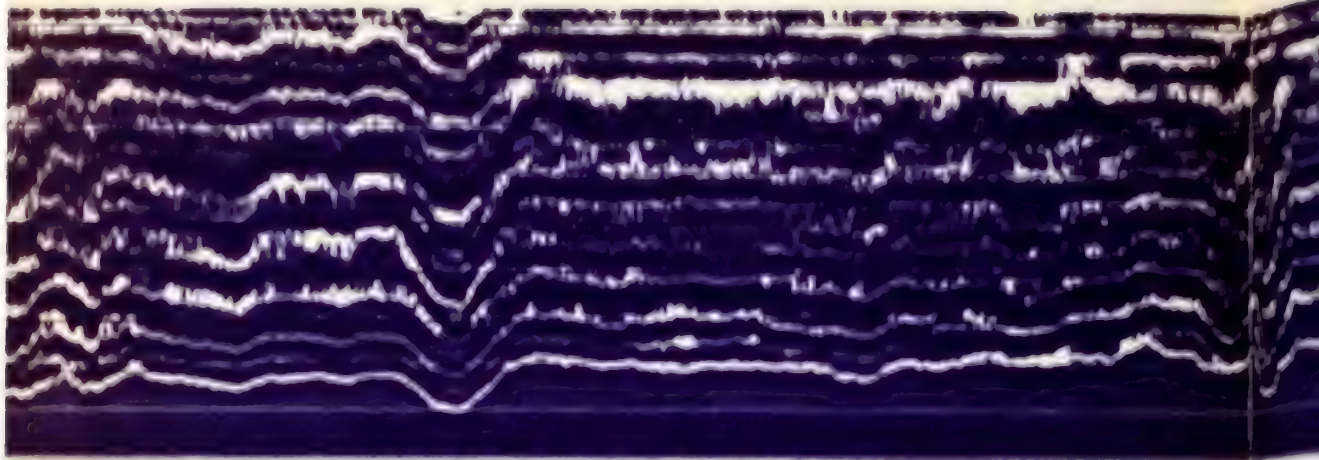
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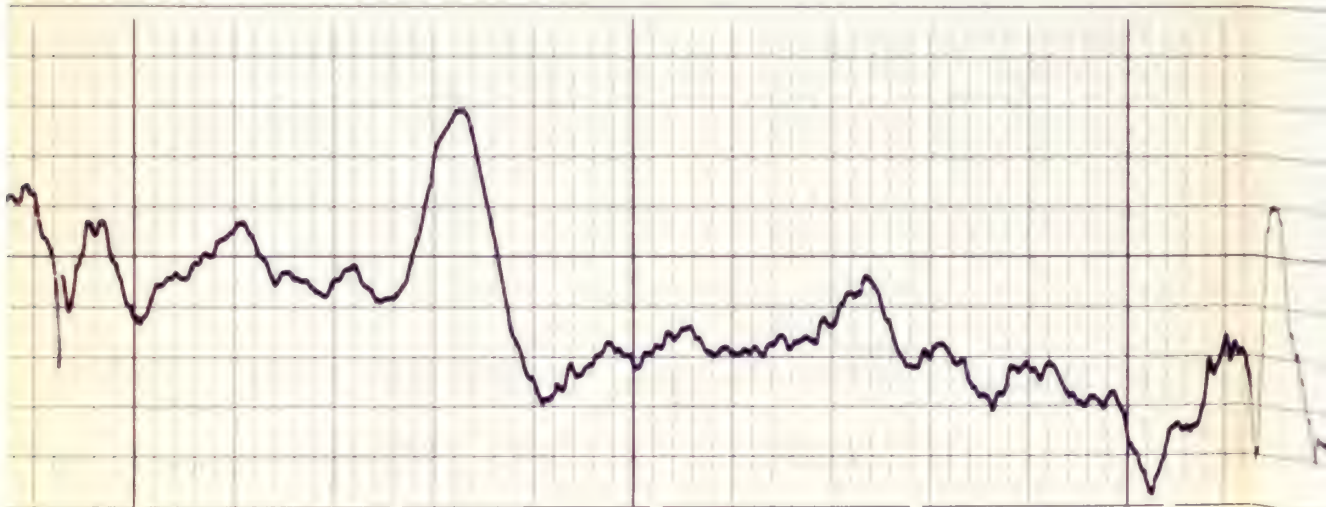
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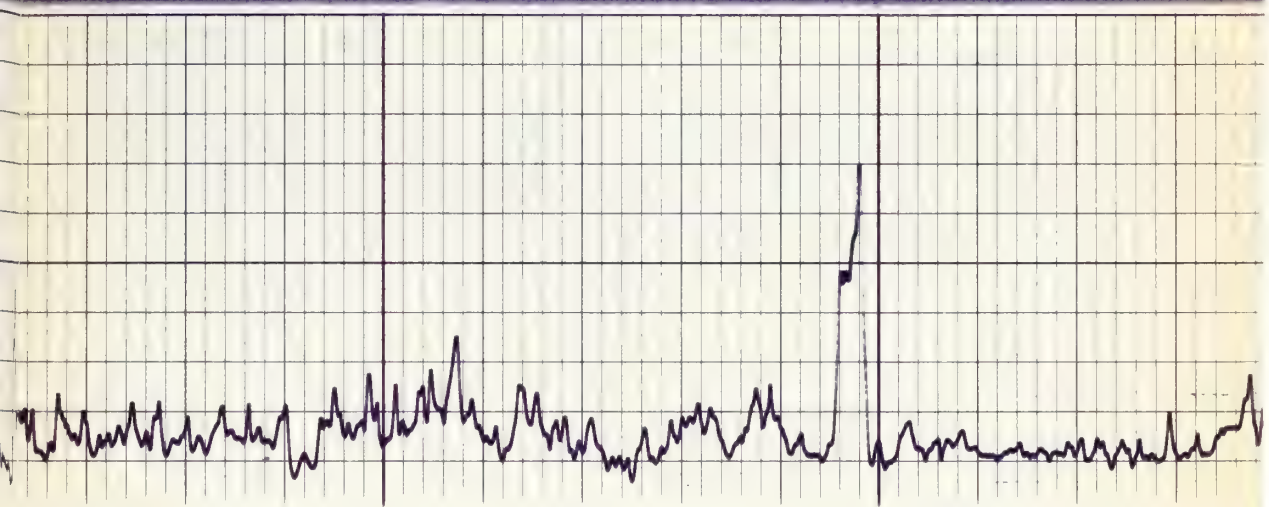
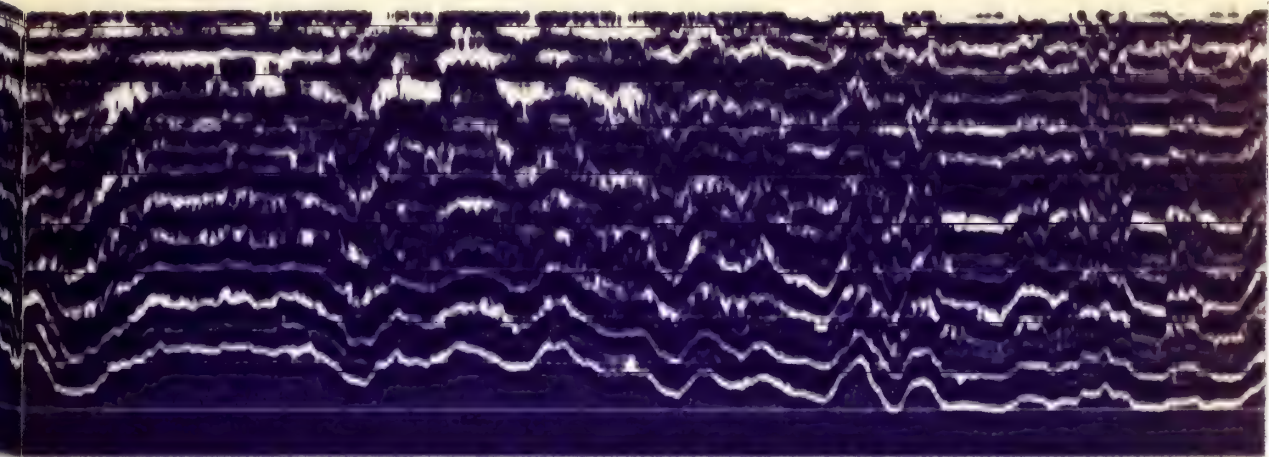




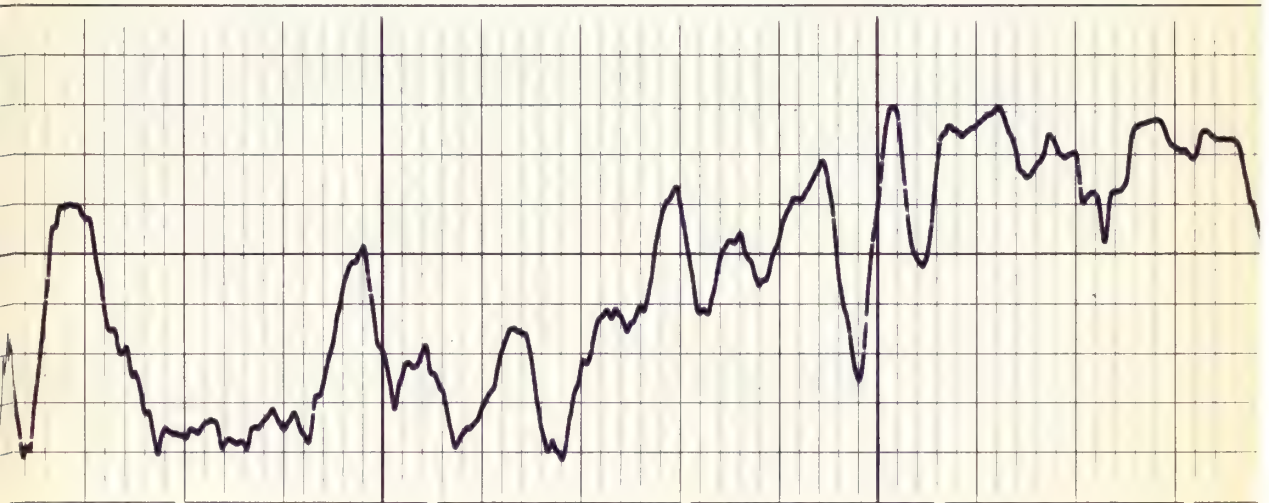
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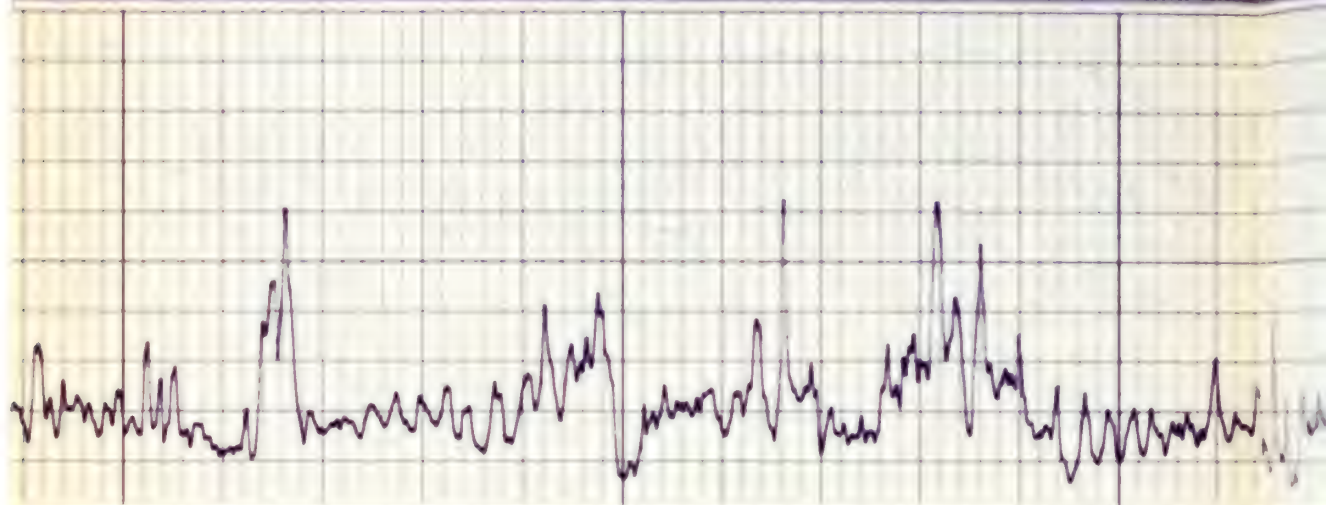
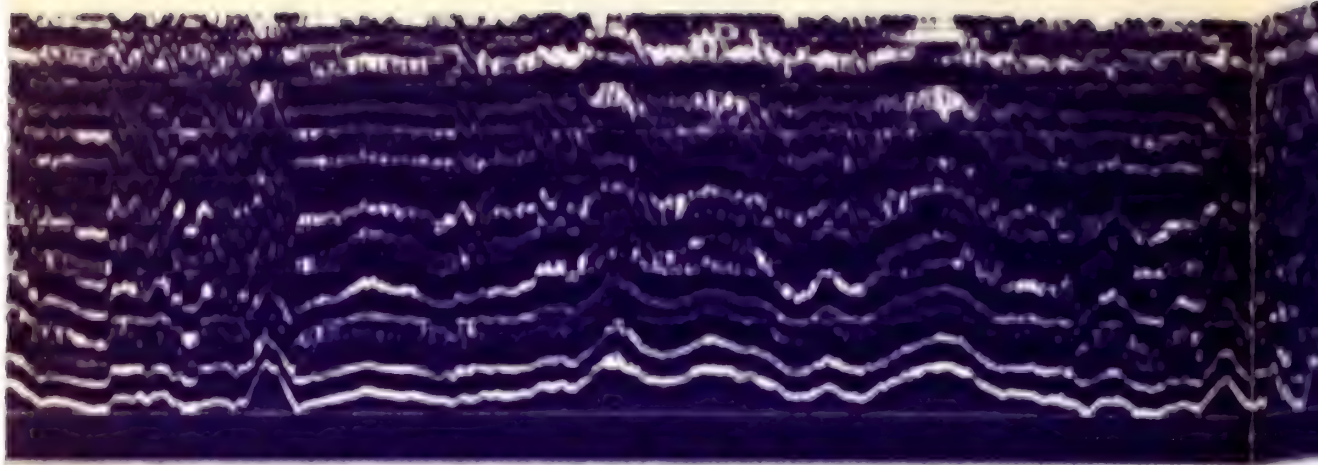
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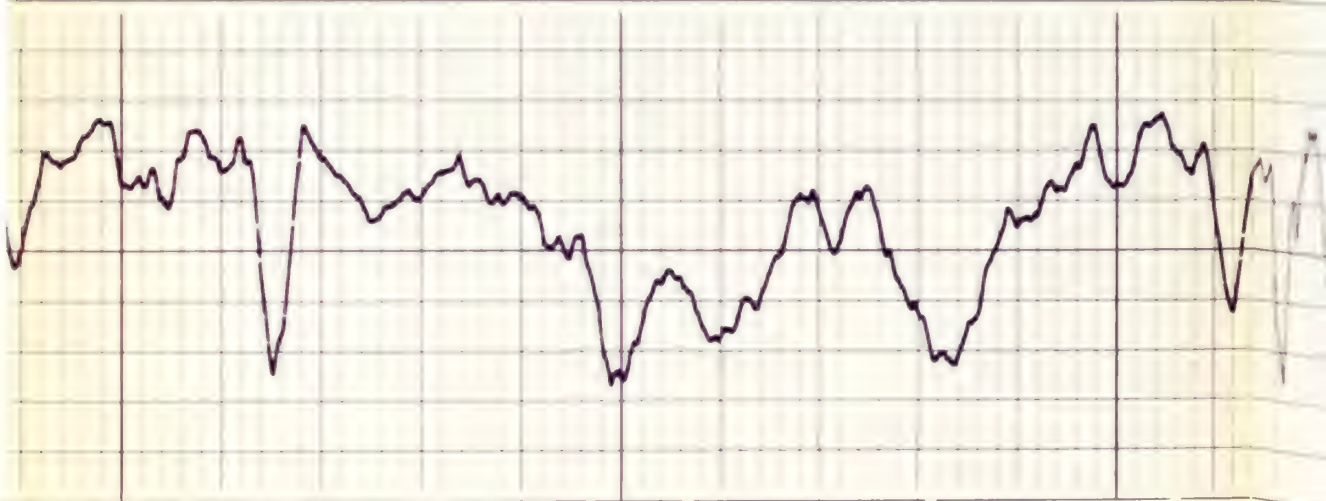


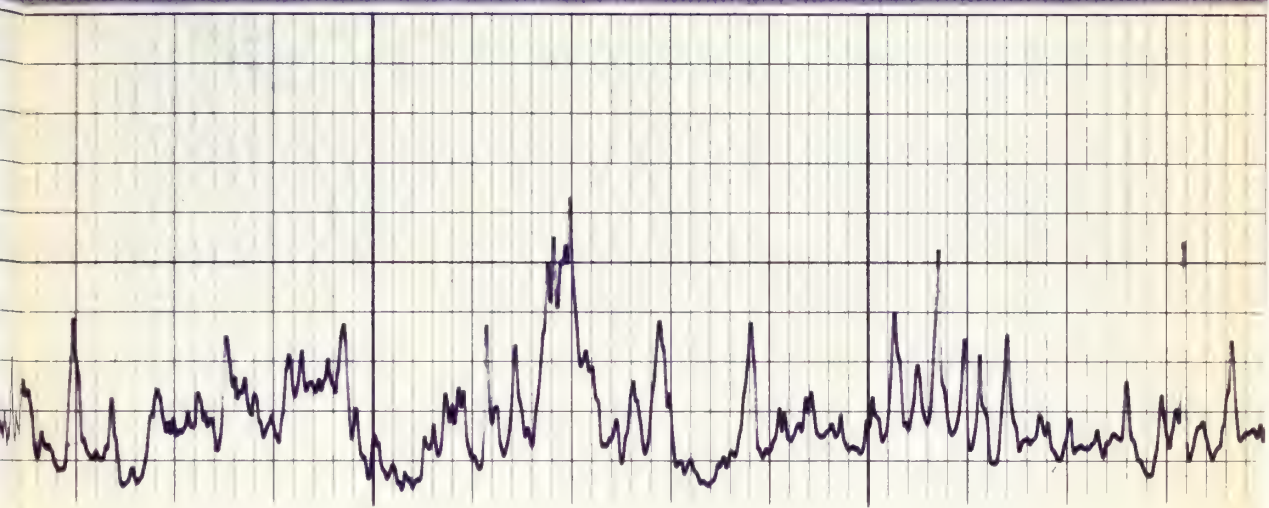
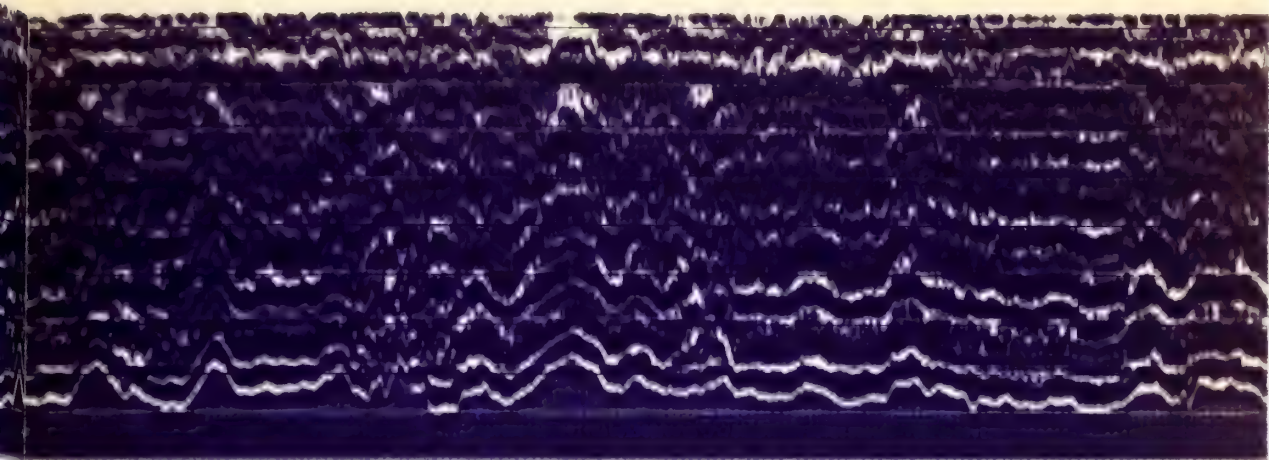
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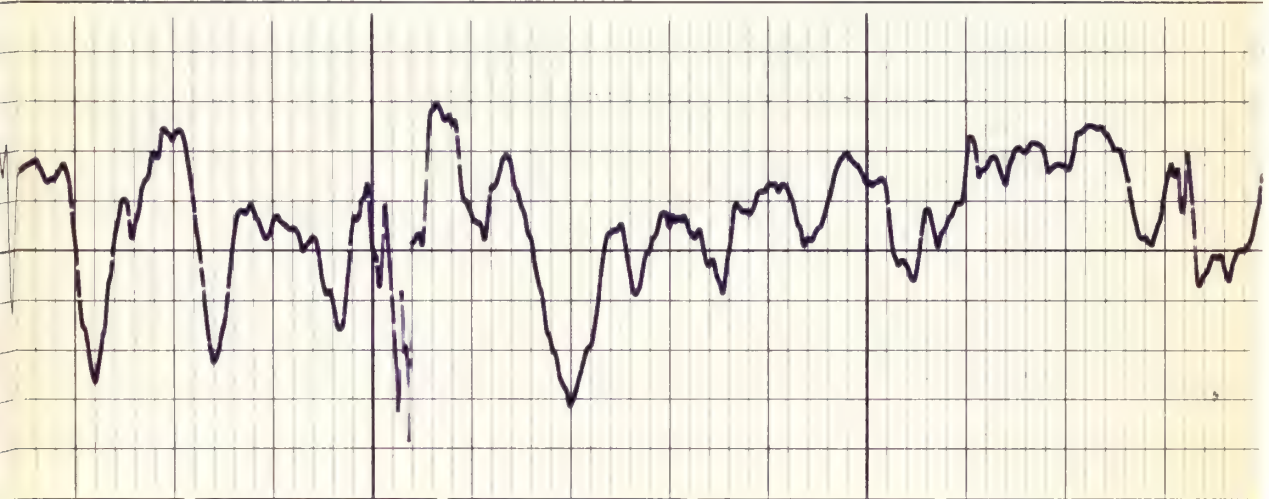


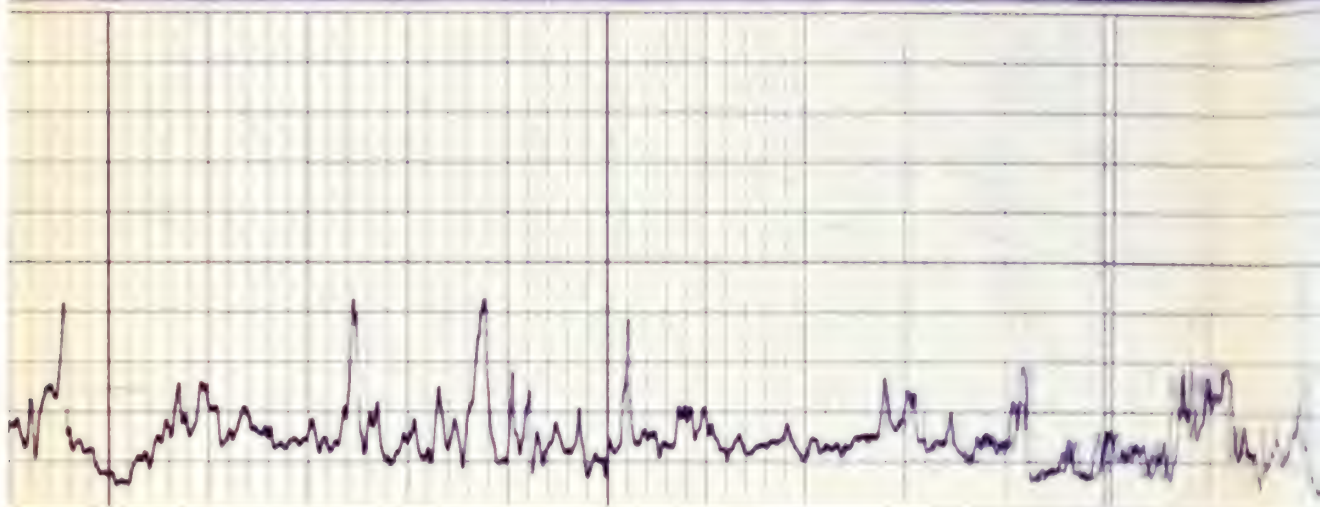
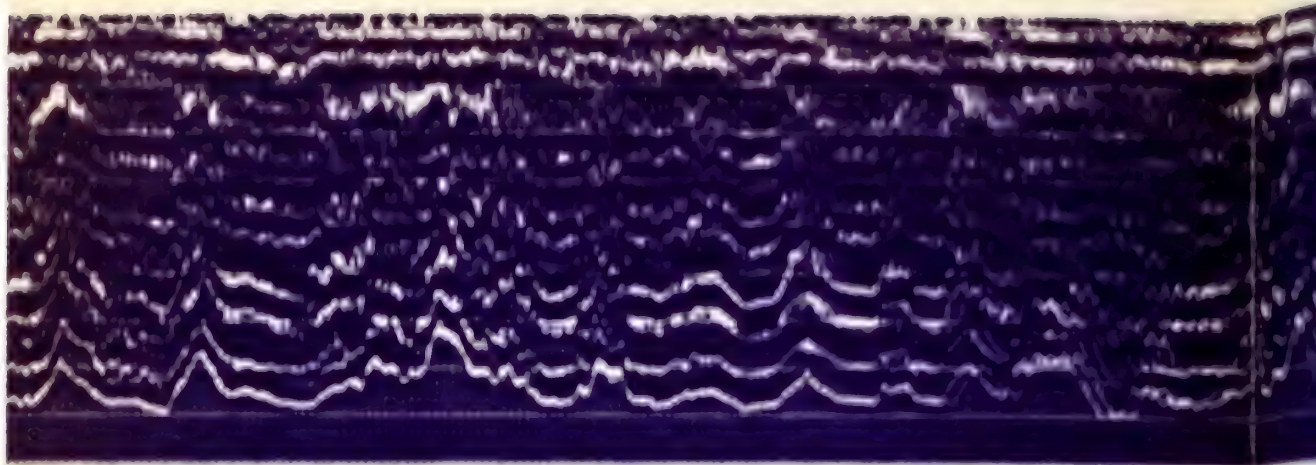
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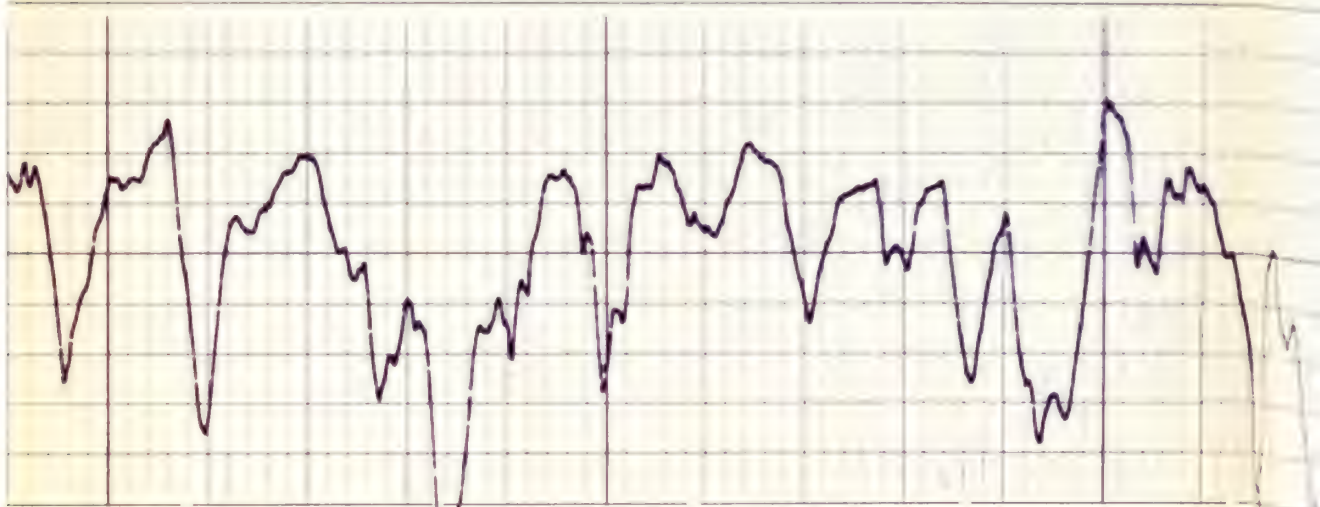
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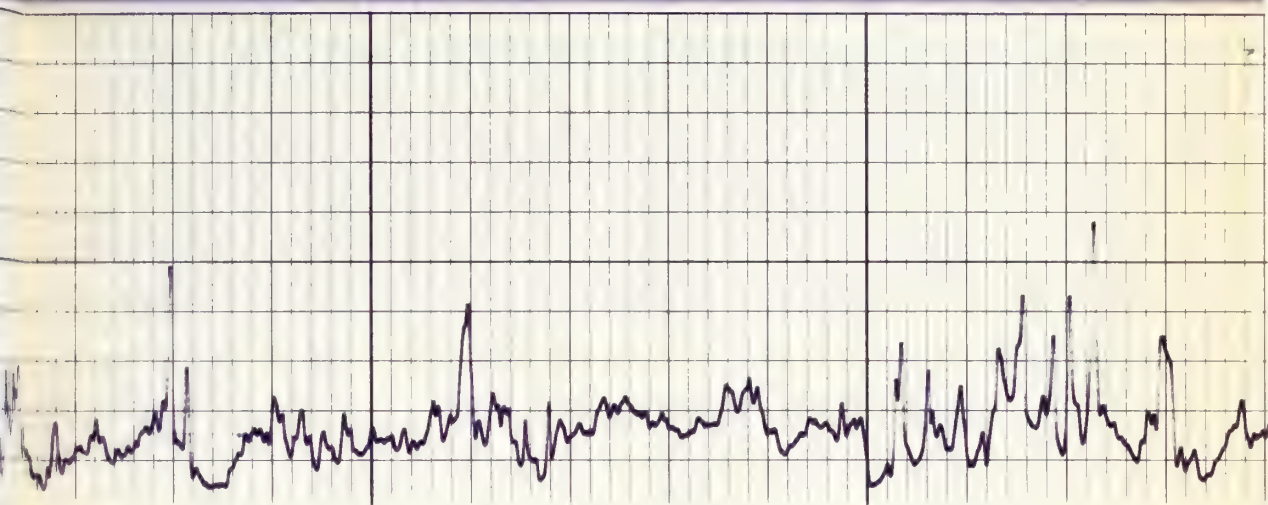
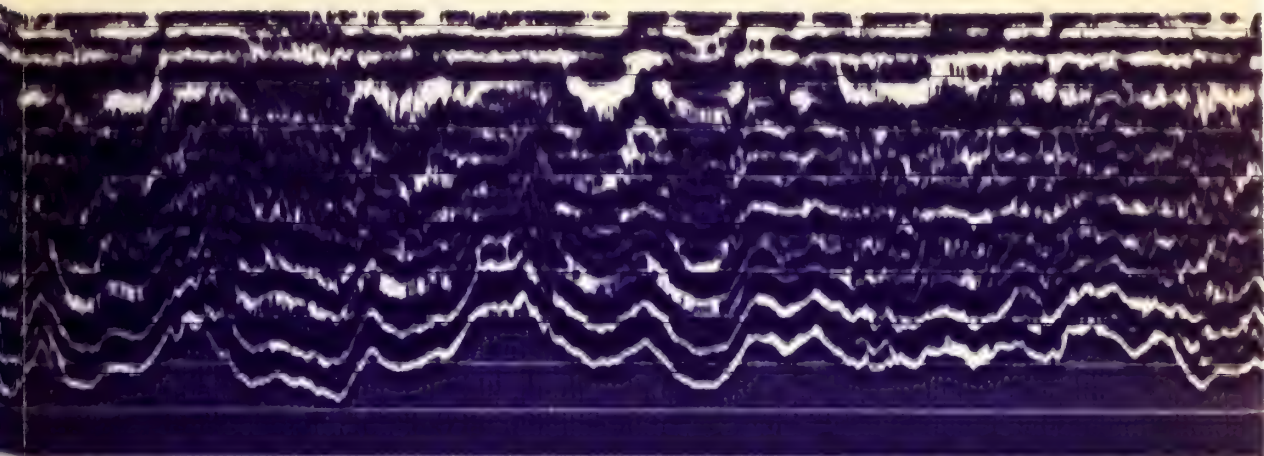




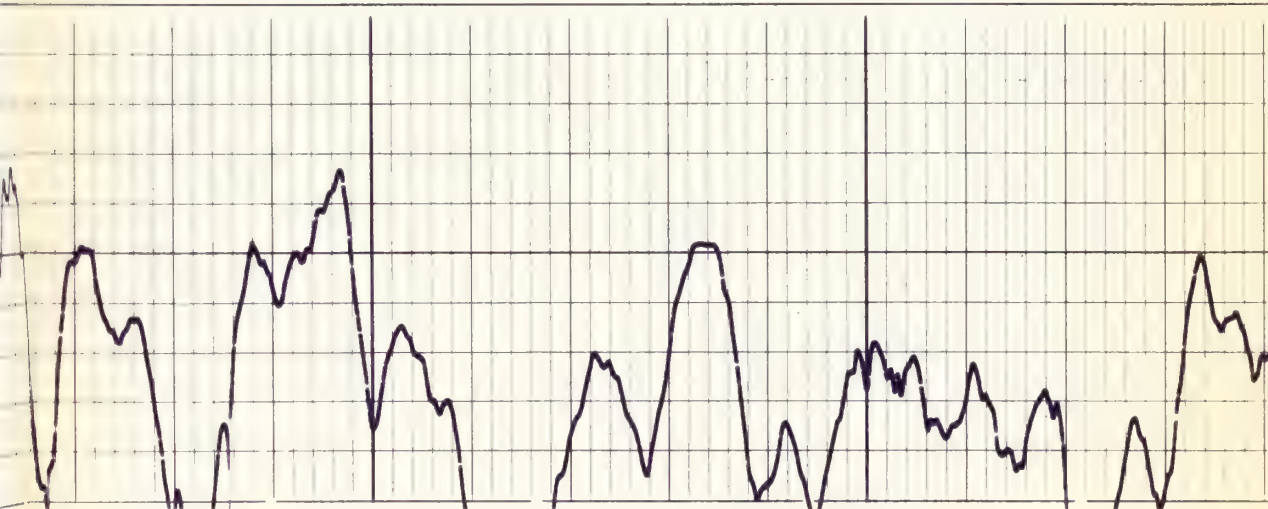
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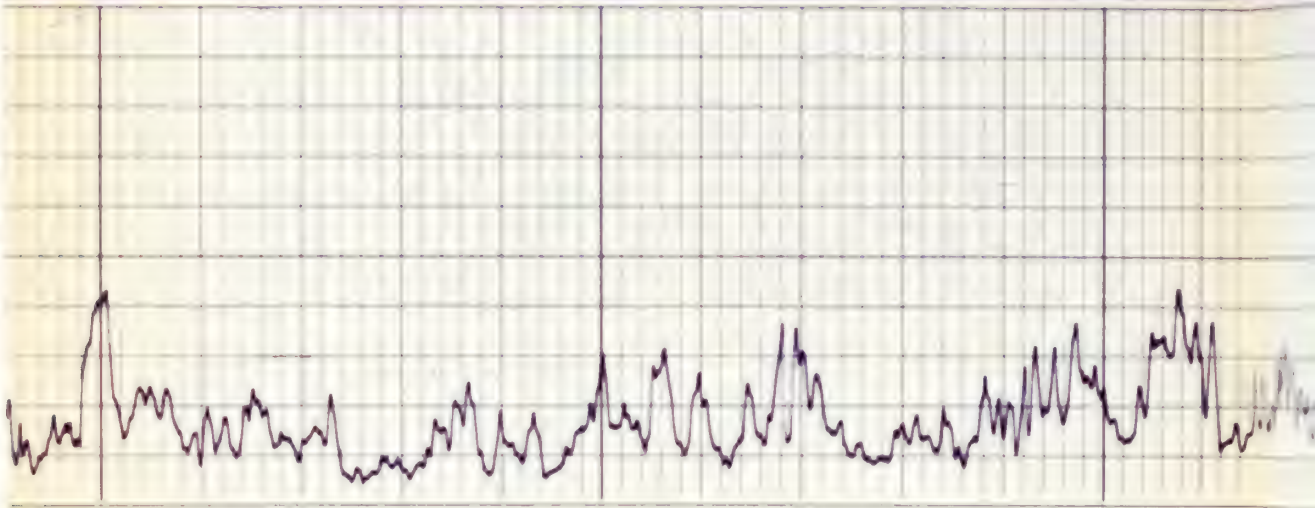
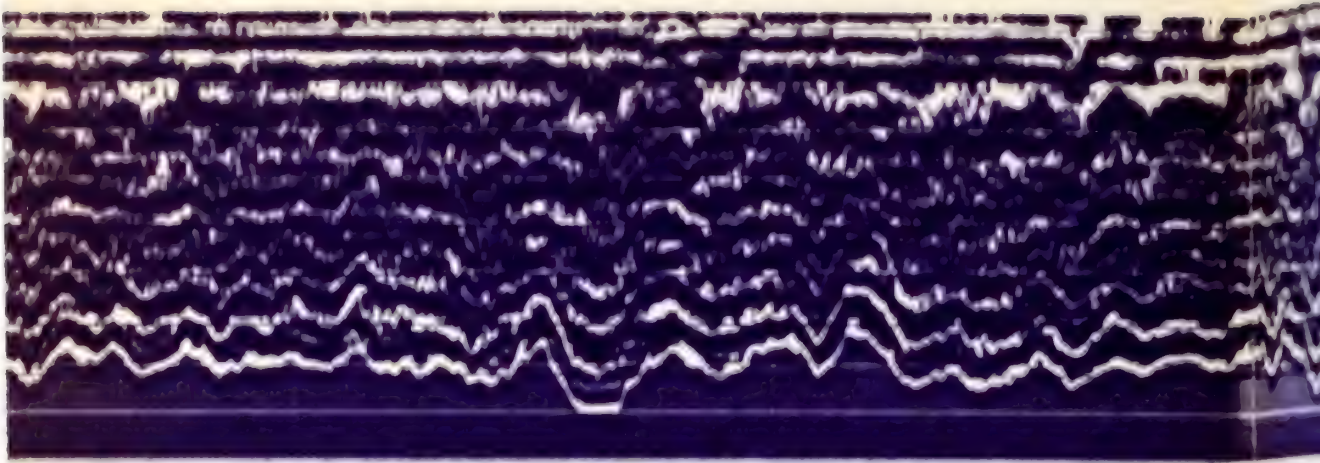
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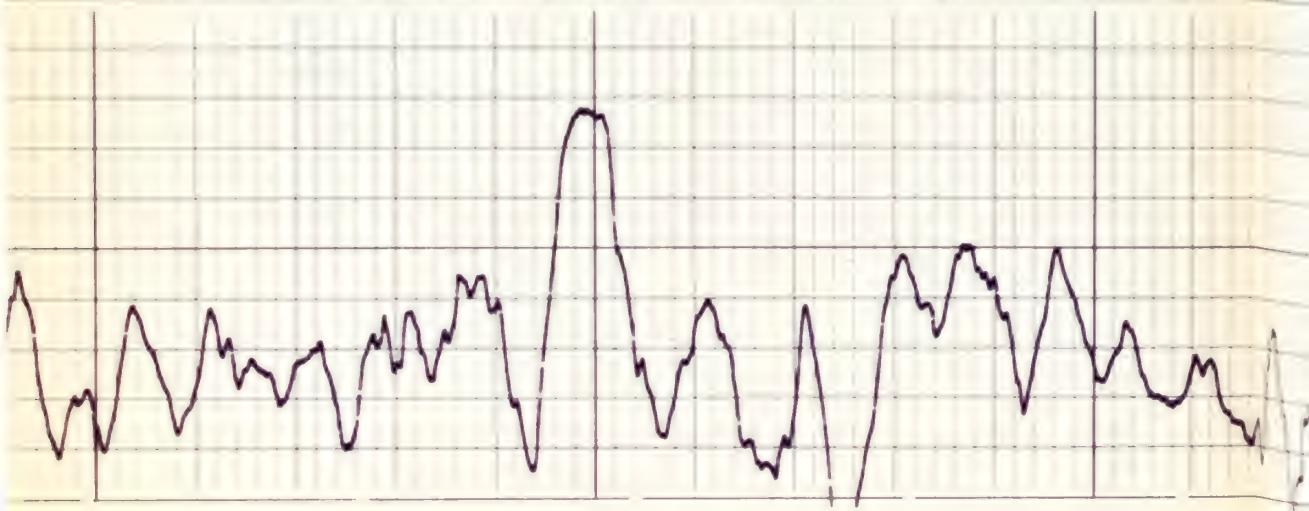


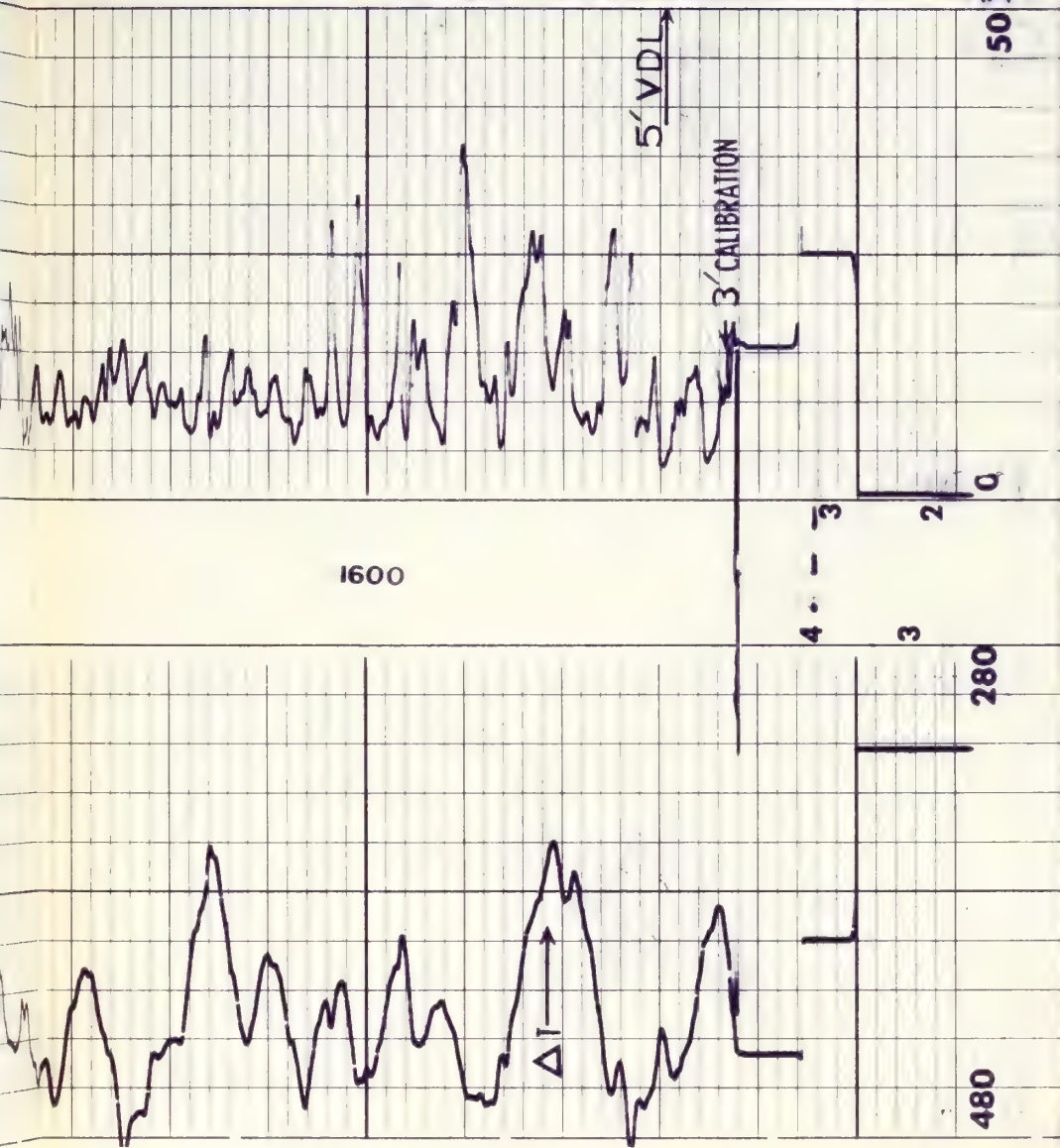
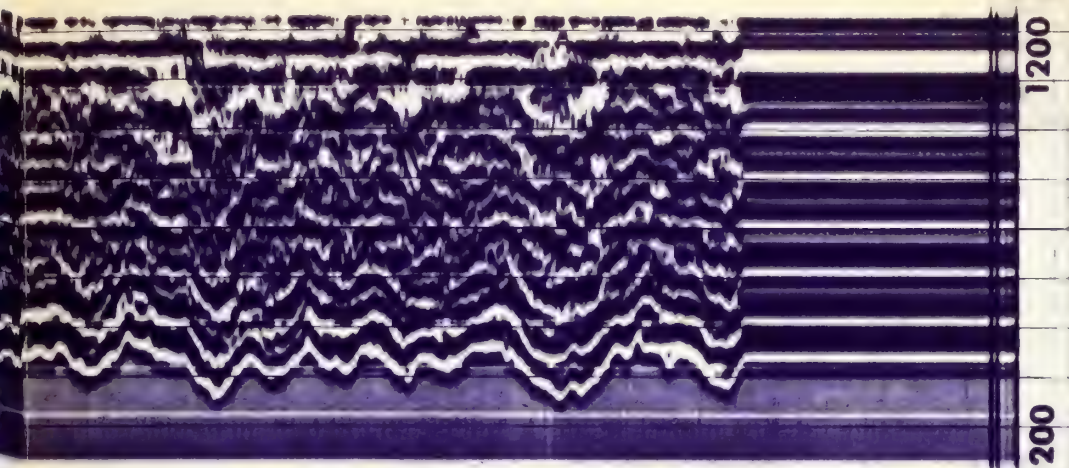
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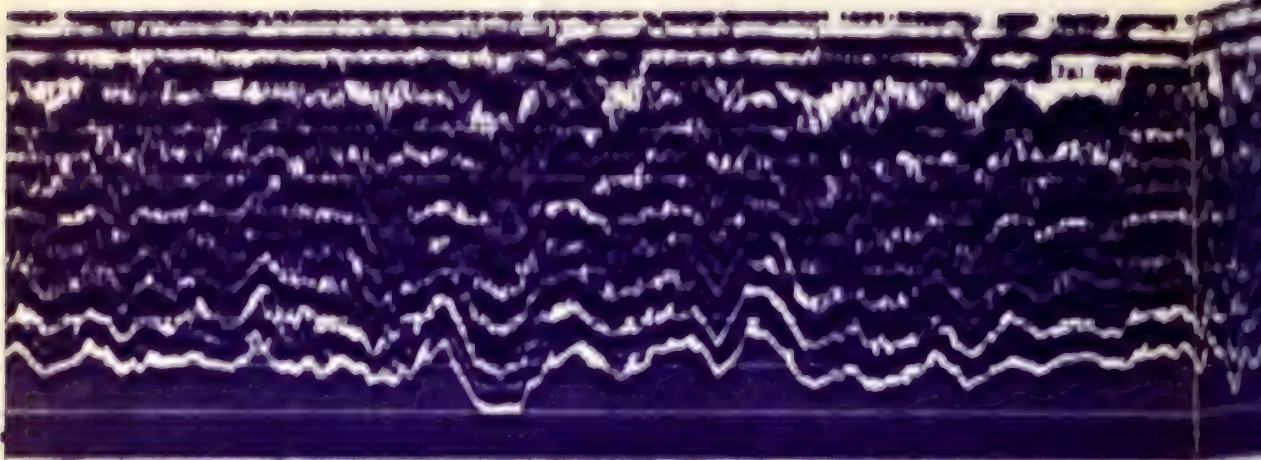




1500







REPEAT SECTION

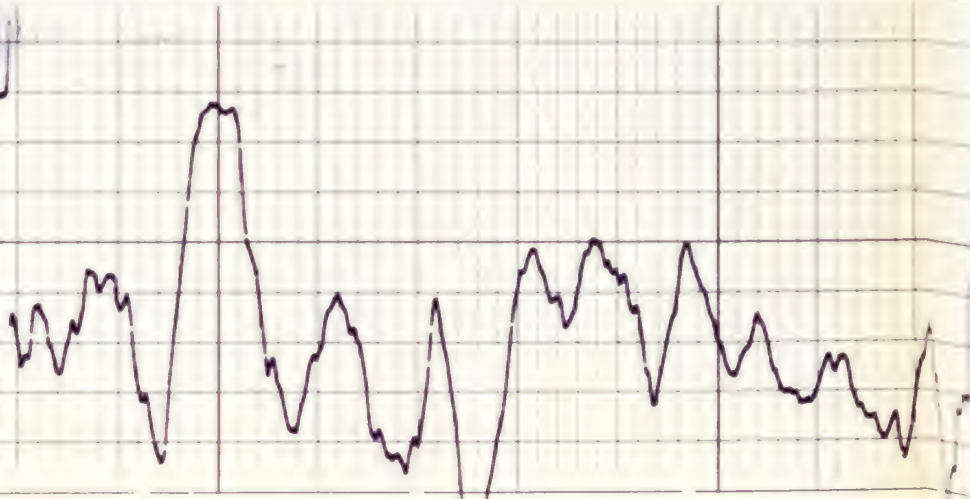
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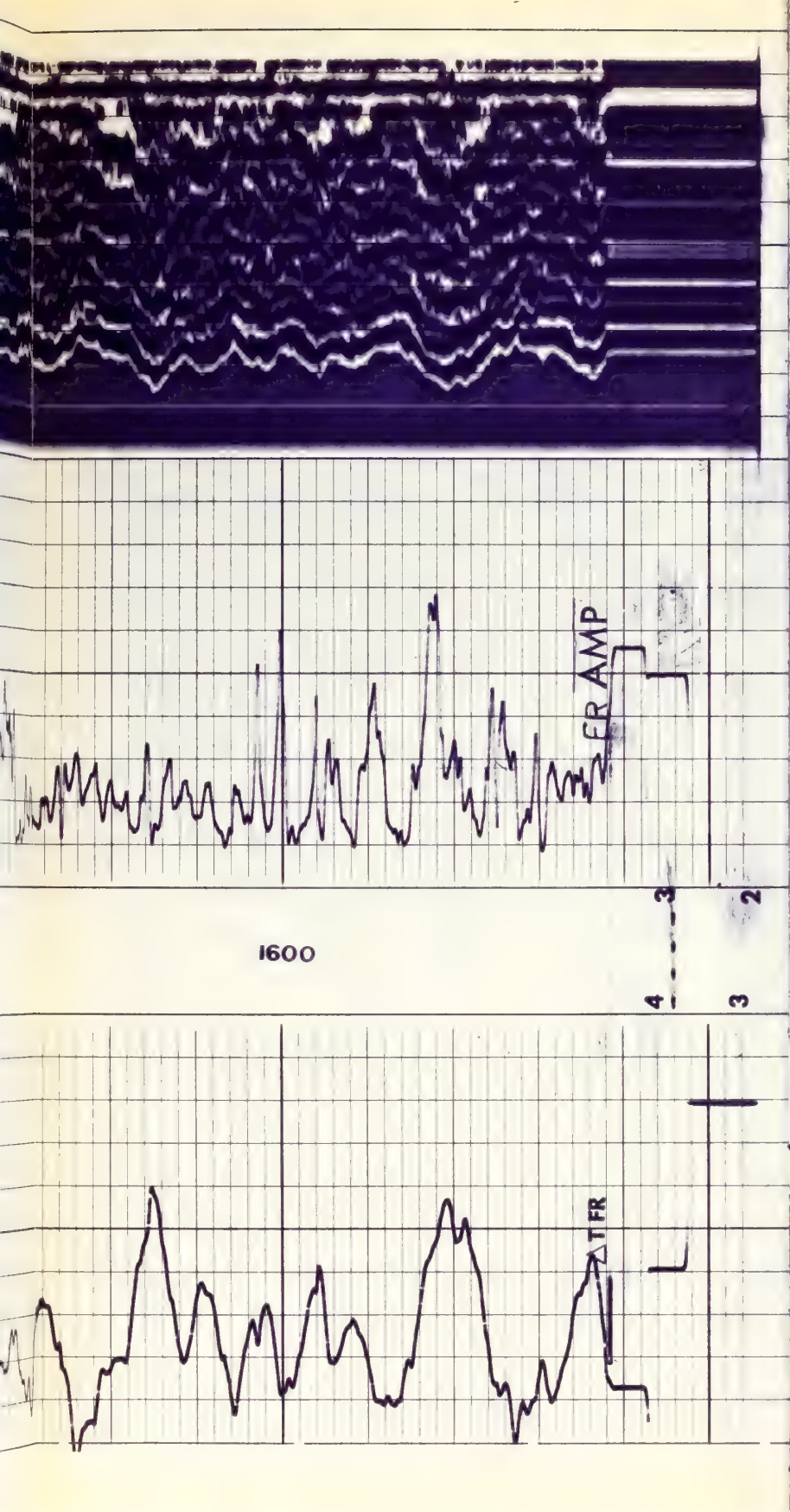
3

1500

4

3





SINGLE RECEIVER ΔT
microseconds

400 200

VARIABLE DENSITY
MICROSECONDS

5 FEET

1200 1200

COMPANY ATLANTIC RICHFIELD COMPANY

SCHL. FR 1633
SCHL. 1717

WELL AT-10

DATE 10/1/73
DRLR TD 10/1/73

FIELD SOUTHERN BULCH

Elev: 1000

COUNTY PICAYUNE STATE LOUISIANA

KB 1000
DF 1000
GL 1000

Schlumberger**DUAL INDUCTION - LATEROLOG
WITH LINEAR CORRELATION LOG**

COUNTY RIO BLANCO, COLO.
FIELD or
LOCATION SORGHUM GULCH
WELL AQUIFER TEST #1-C
COMPANY ATLANTIC RICHFIELD

COMPANY THE ATLANTIC RICHFIELD COMPANYWELL AQUIFER TEST #1-CFIELD SORGHUM GULCHCOUNTY RIO BLANCO STATE COLORADO

Location.

API Serial No. _____

Sec. 7 Twp. 3-S Rge. 96-W

Other Services:

HRT
FDC-CNL-GR
BHC-GR

Permanent Datum: GL; Elev.: 6909
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. _____
D.F. _____
G.L. 6909

| | | | | | |
|---|--------------------|----------|----------|----------|----------|
| Date | <u>8/18/74</u> | | | | |
| Run No. | <u>ONE</u> | | | | |
| Depth-Driller | <u>1640</u> | | | | |
| Depth-Logger | <u>1646</u> | | | | |
| Btm. Log Interval | <u>1642</u> | | | | |
| Top Log Interval | <u>61</u> | | | | |
| Casing-Driller | <u>8-5/8 @ 59</u> | <u>@</u> | <u>@</u> | <u>@</u> | <u>@</u> |
| Casing-Logger | <u>61</u> | | | | |
| Bit Size | <u>7-7/8</u> | | | | |
| Type Fluid in Hole | <u>WATER</u> | | | | |
| Fluid Level | <u>432</u> | | | | |
| Dens. | Visc. | | | | |
| pH | Fluid Loss | ml | ml | ml | ml |
| Source of Sample | | | | | |
| R _m @ Meas. Temp. | <u>@</u> | <u>F</u> | <u>@</u> | <u>F</u> | <u>@</u> |
| R _{mf} @ Meas. Temp. | <u>@</u> | <u>F</u> | <u>@</u> | <u>F</u> | <u>@</u> |
| R _{mc} @ Meas. Temp. | <u>@</u> | <u>F</u> | <u>@</u> | <u>F</u> | <u>@</u> |
| Source: R _{mf} R _{mc} | | | | | |
| R _m @ BHT | <u>@</u> | <u>F</u> | <u>@</u> | <u>F</u> | <u>@</u> |
| Time Since Circ. | <u>6 HOURS</u> | | | | |
| Max. Rec. Temp. | <u>86</u> | <u>F</u> | <u>F</u> | <u>F</u> | <u>F</u> |
| Equip. Location | <u>5602 G.J.</u> | | | | |
| Recorded By | <u>BARGHOUTI</u> | | | | |
| Witnessed By | <u>TAIT</u> | | | | |

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

SCALE CHANGES

| Date | Sample No | Type Log | Depth | Scale Up Hole | Scale Down Hole |
|--------------------|------------|----------|-------|---------------|-----------------|
| Depth - Driller | | | | | |
| Type Fluid in Hole | | | | | |
| Dens | Visc. | | | | |
| ph | Fluid Loss | ml | | | |
| Source of Sample | | | | | |
| Rm @ Meas. Temp. | | F | | | |
| Rmf @ Meas. Temp. | | F | | | |
| Rmc @ Meas. Temp. | | F | | | |
| Source: Rmf | Rmc | | | | |
| Rm @ BHT | | F | | | |
| Rmf @ BHT | | F | | | |
| Rmc @ BHT | | F | | | |

EQUIPMENT DATA

REMARKS

Service Order No. 15129

Run No. ONE

Panel No. CB-180

Cart. No. B-163

Sonde No. DB-49

Mem. Panel No. B-238

G.R. Cart No.

G.R. Panel No.

TTR No.

Cent. Device

Stand off - Inches

Time Const. - Sec.

Speed - F.P.M.

70

TOP ELEKTRODE OUT OF FLUID

NOTE POOR REPEAT SECTION

☐ Surface determined sande errors used for 6FF40.☐ 6FF40 sonde error corrected for

borehole signal at Rm =

☒ 6FF40 zero set in hole at depth of

inch

1200 feet

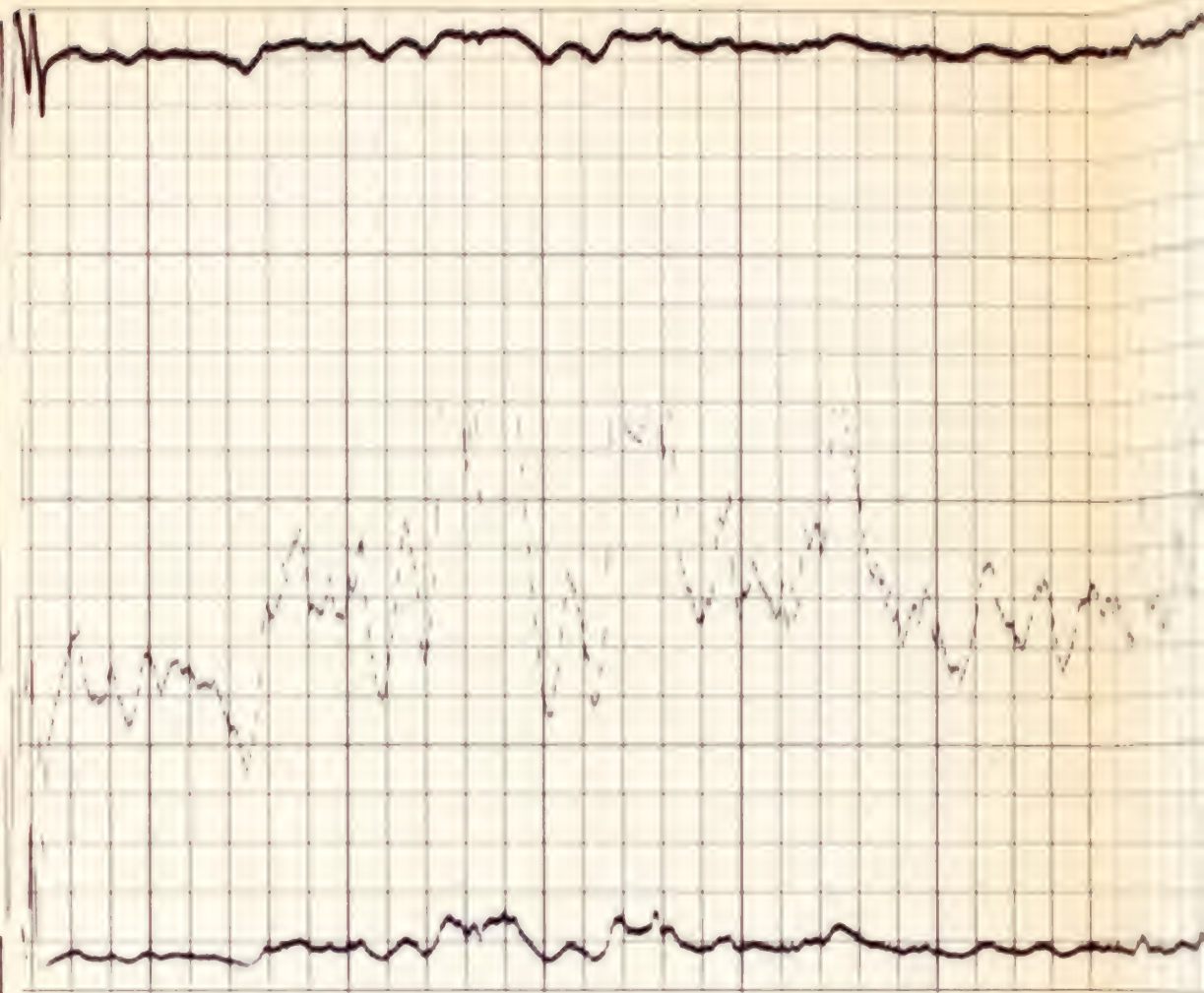
CALIBRATION DATA

| | | | | | | |
|--------------|----------|--------|-------------|------------|-----------|--------|
| CALIBRATION: | BACKGND: | SOURCE | GALV. INCR. | SENS. TAP | SENS. TAP | TIME |
| | CPS. | CPS. | DIVISION | (FOR CAL.) | (RECORD) | CONST. |
| GAMMA RAY: | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

| | | | |
|---|--|--|--|
| SPONTANEOUS-POTENTIAL MILLIVOLTS | | CONDUCTIVITY $\text{MILLIMHOS / M} = \frac{1000}{\text{OHMS. M}^2/\text{M}}$ | |
| <div><div>10</div><div>— —</div><div>MV</div><div>+</div></div> | DEEP INDUCTION LOG | | |
| | <div>4002000</div> | | |
| | <div>RESISTIVITY OHMS. M²/M</div> | | |
| | <div>DEEP INDUCTION LOG</div> <div>010001000</div> | | |
| | <div>AVERAGED LATEROLOG - 8</div> <div>01001000</div> | | |
| | | | |
| | | | |

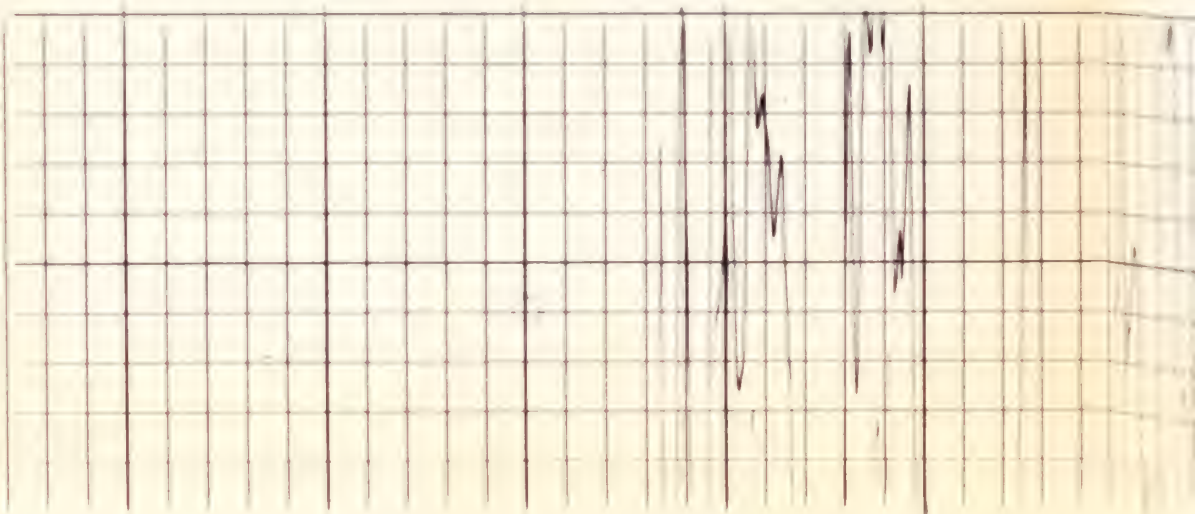
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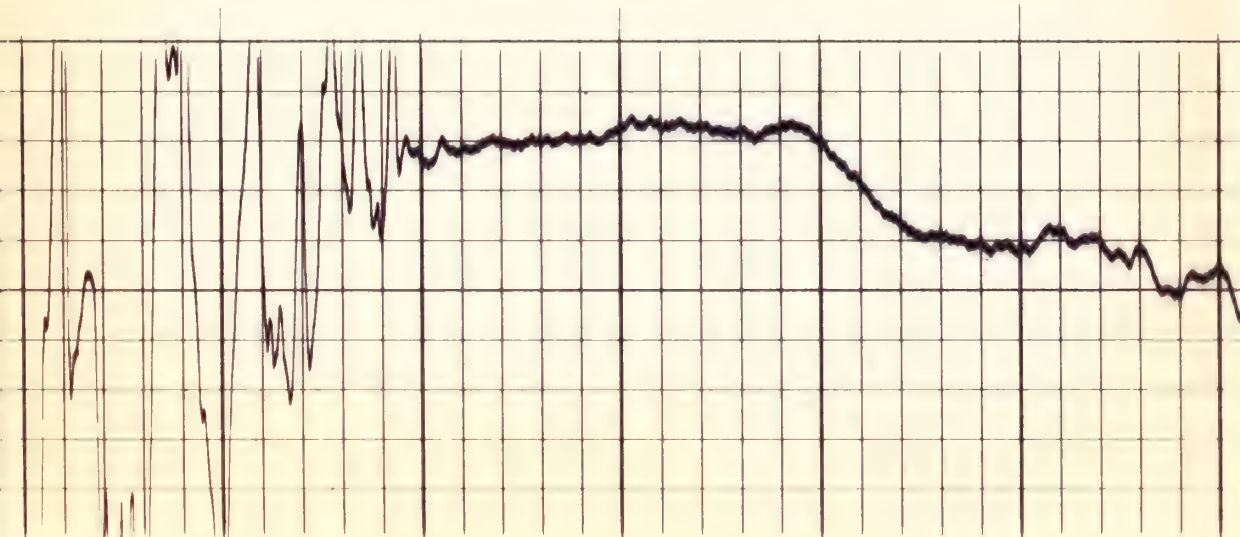
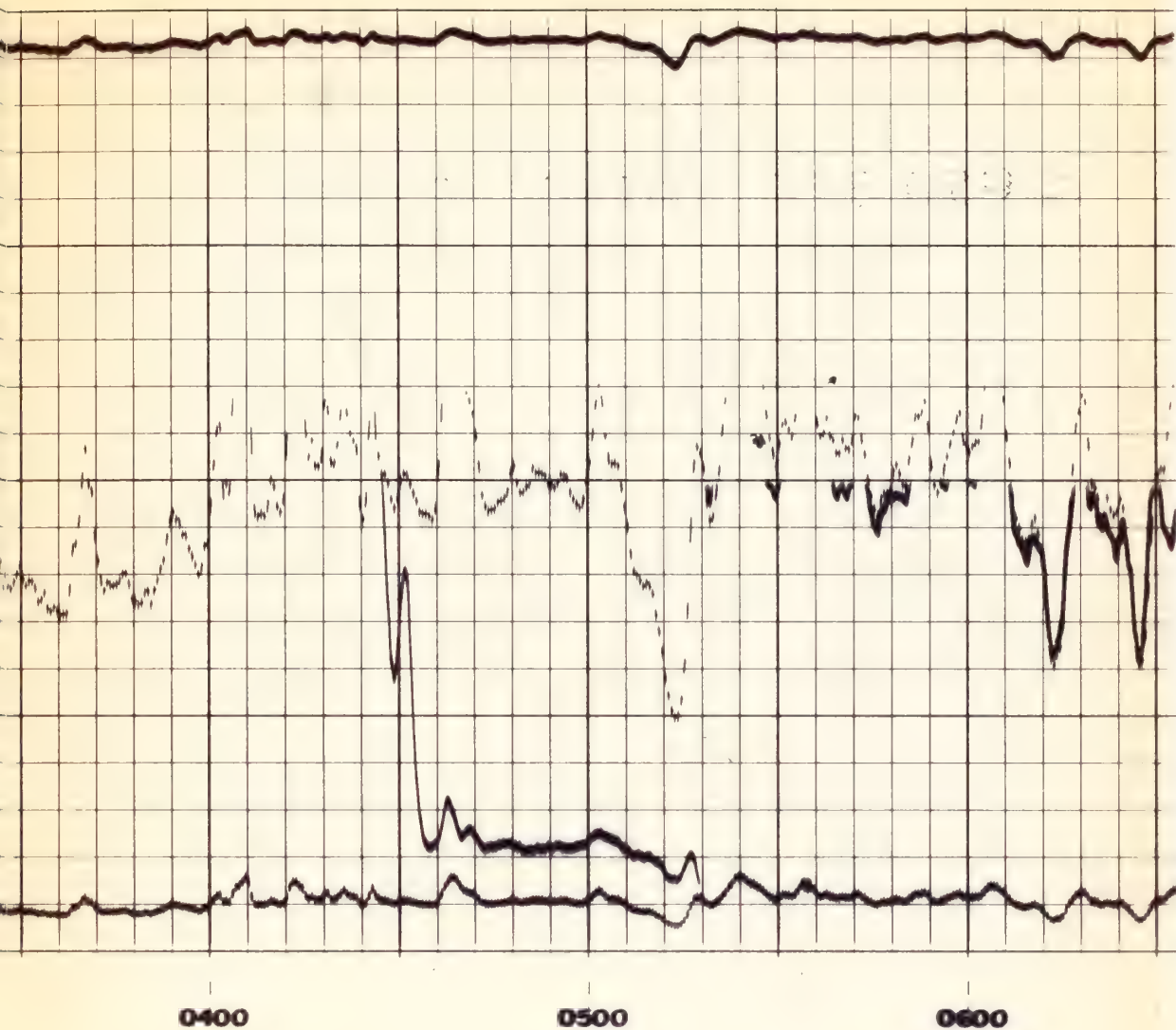


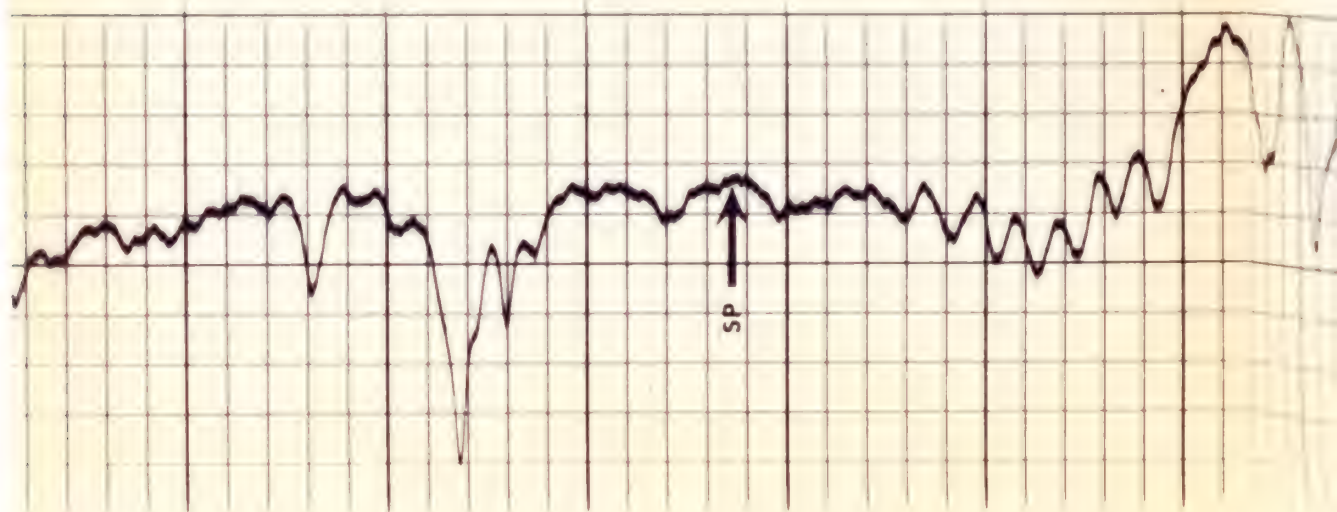
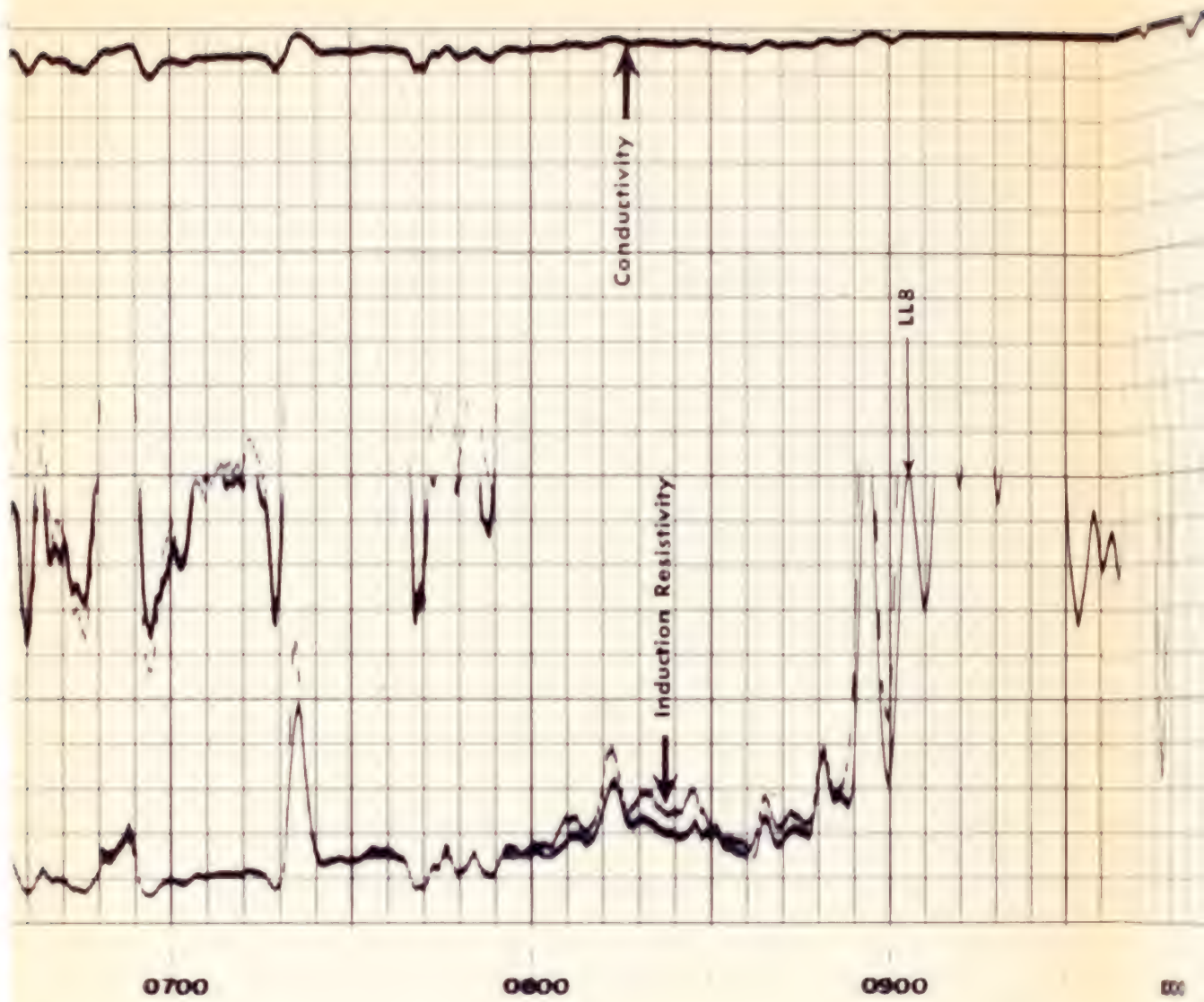
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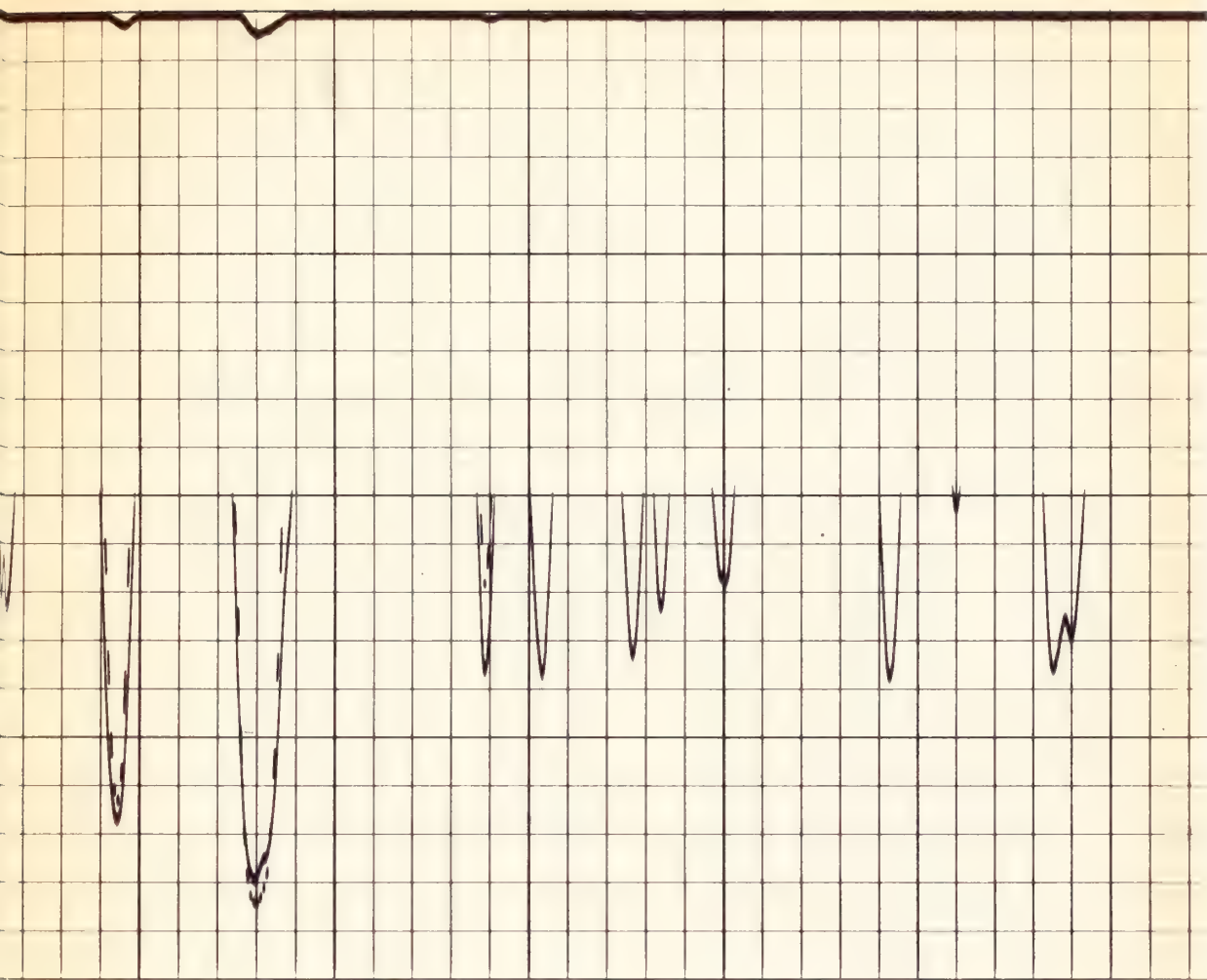
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0300





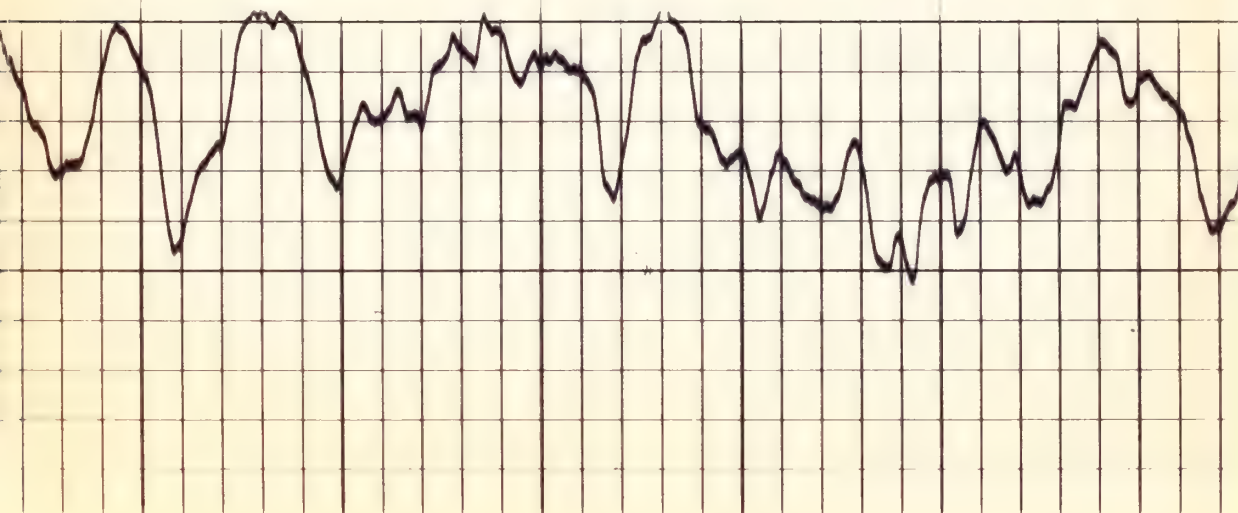


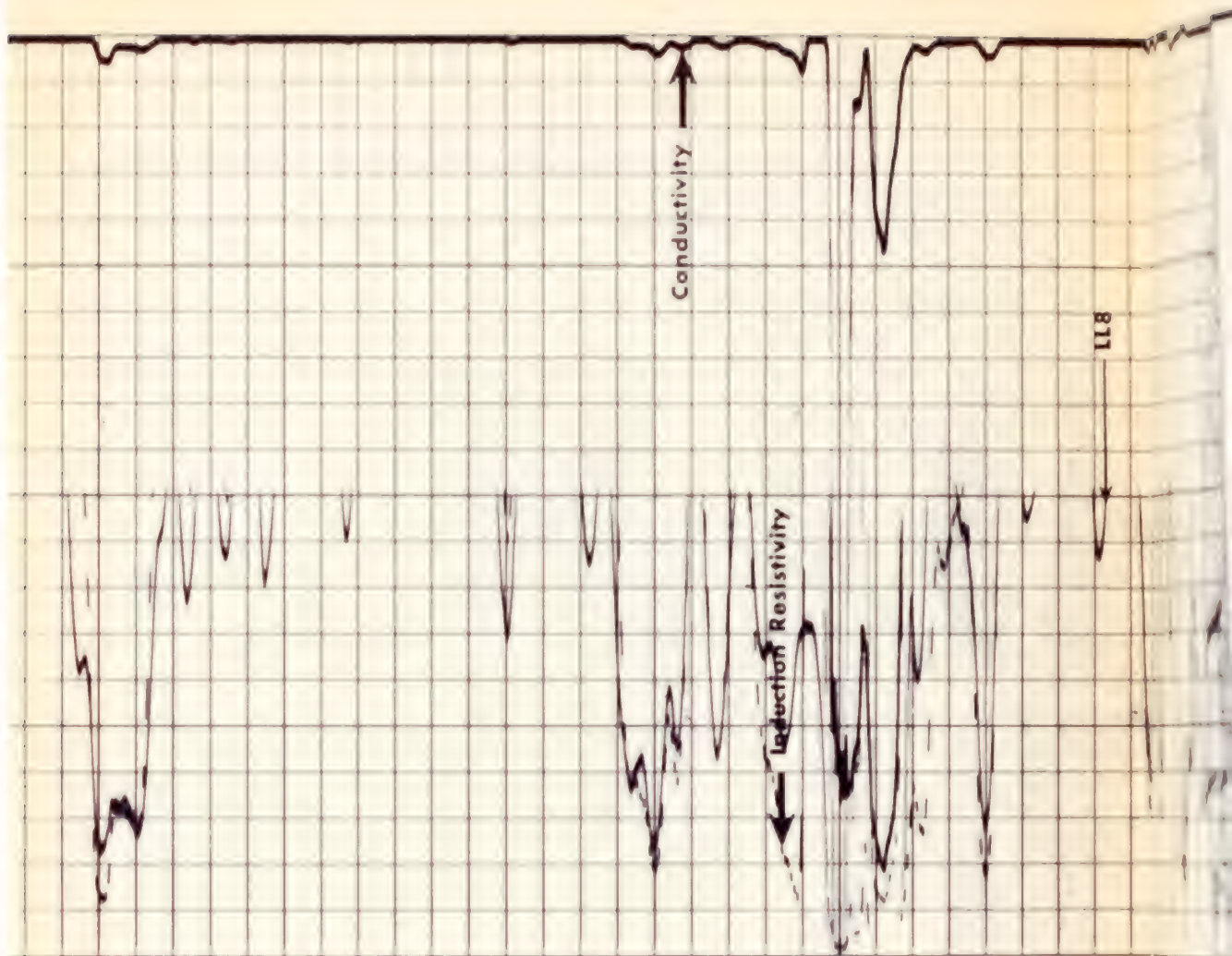


1000

800

1200

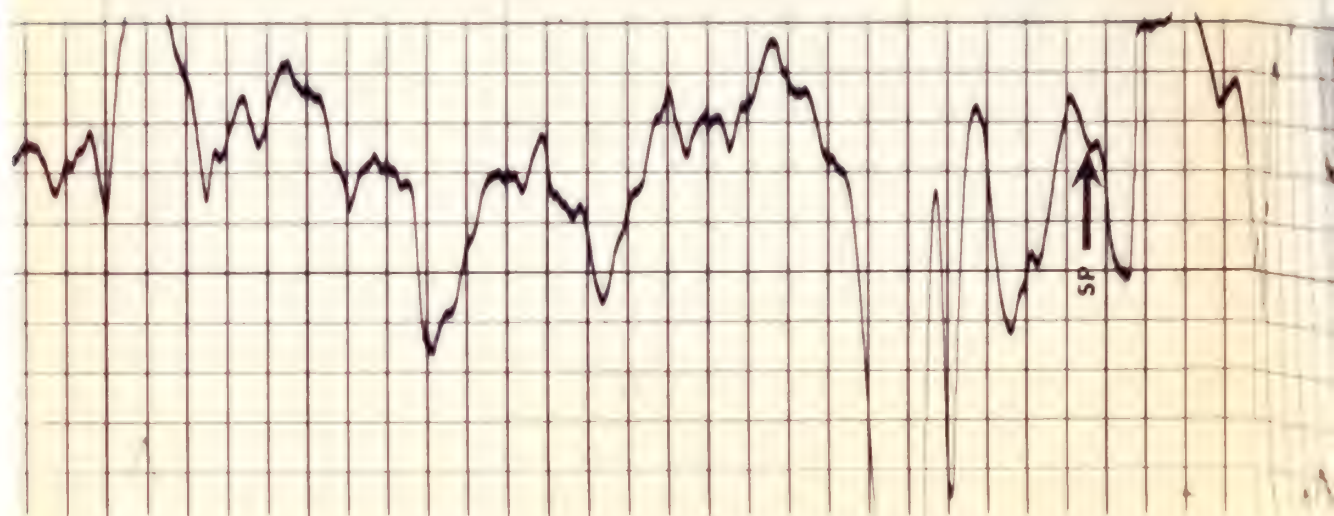




300

400

500



1600

DETAIL LOG

5" = 100'

SPONTANEOUS-POTENTIAL

MILLIVOLTS

— $\left| \begin{array}{c} 10 \\ \updownarrow \\ \text{mV} \end{array} \right|$ +

DEPTHS

RESISTIVITY

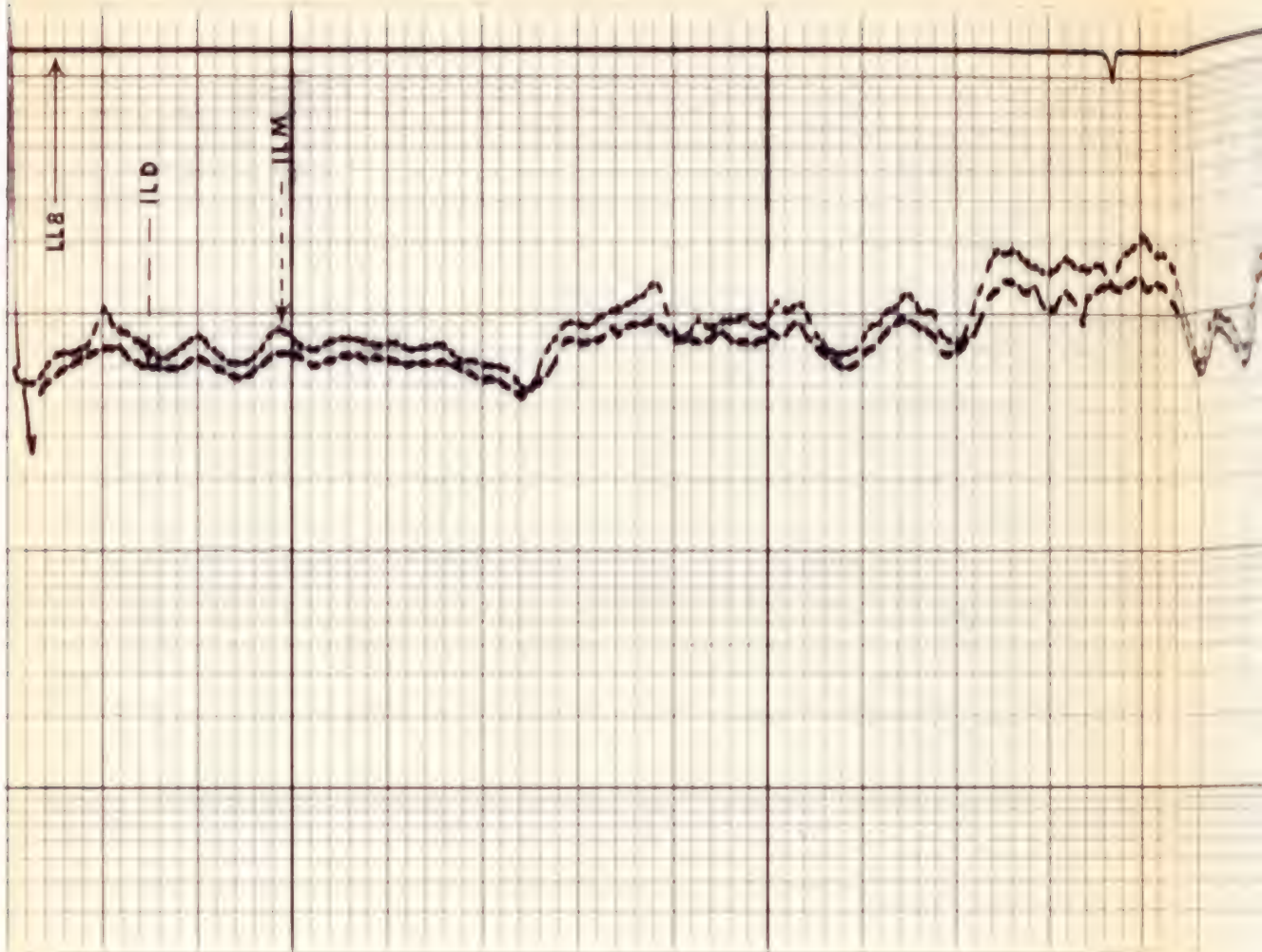
OHMS. M²/M

DEEP INDUCTION LOG

MEDIUM INDUCTION LOG

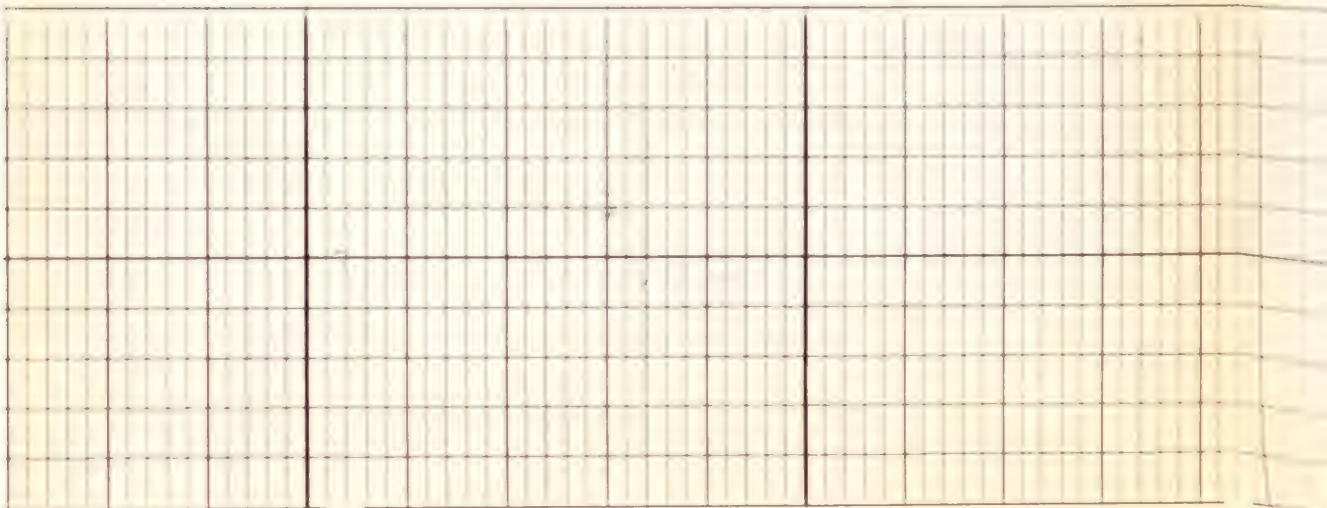
LATEROLOG — 8

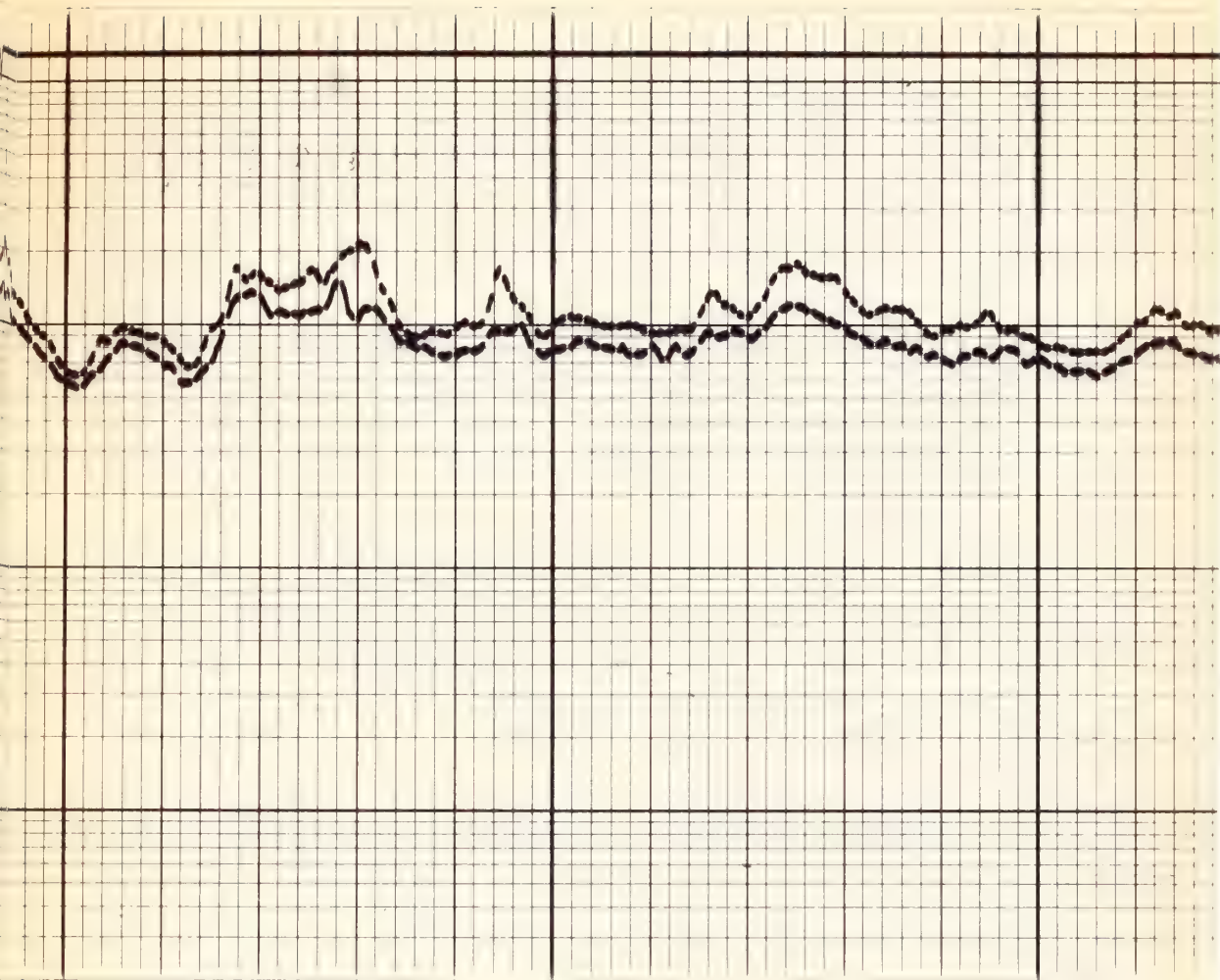
Casing



0100

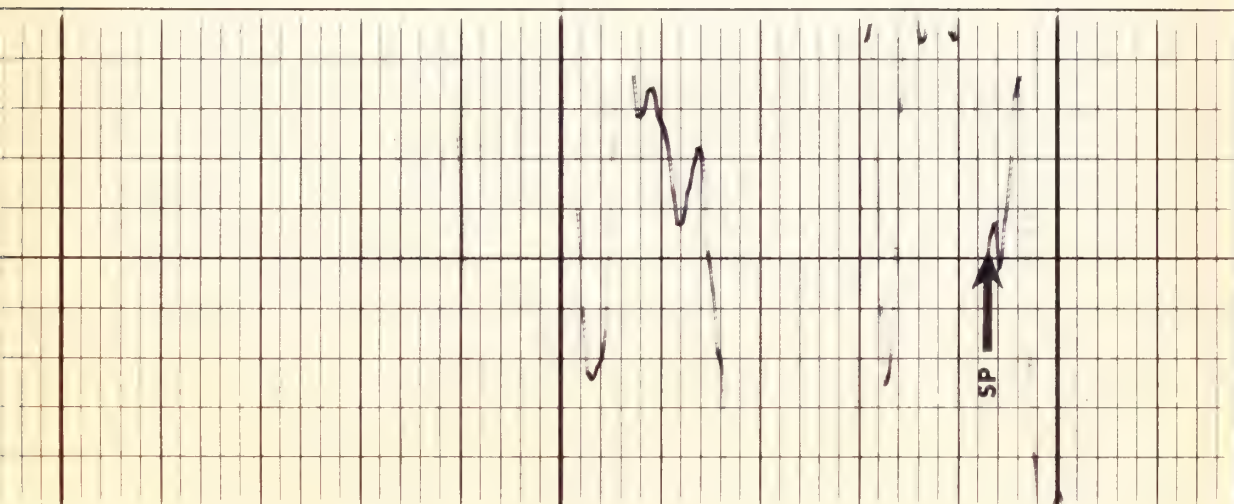
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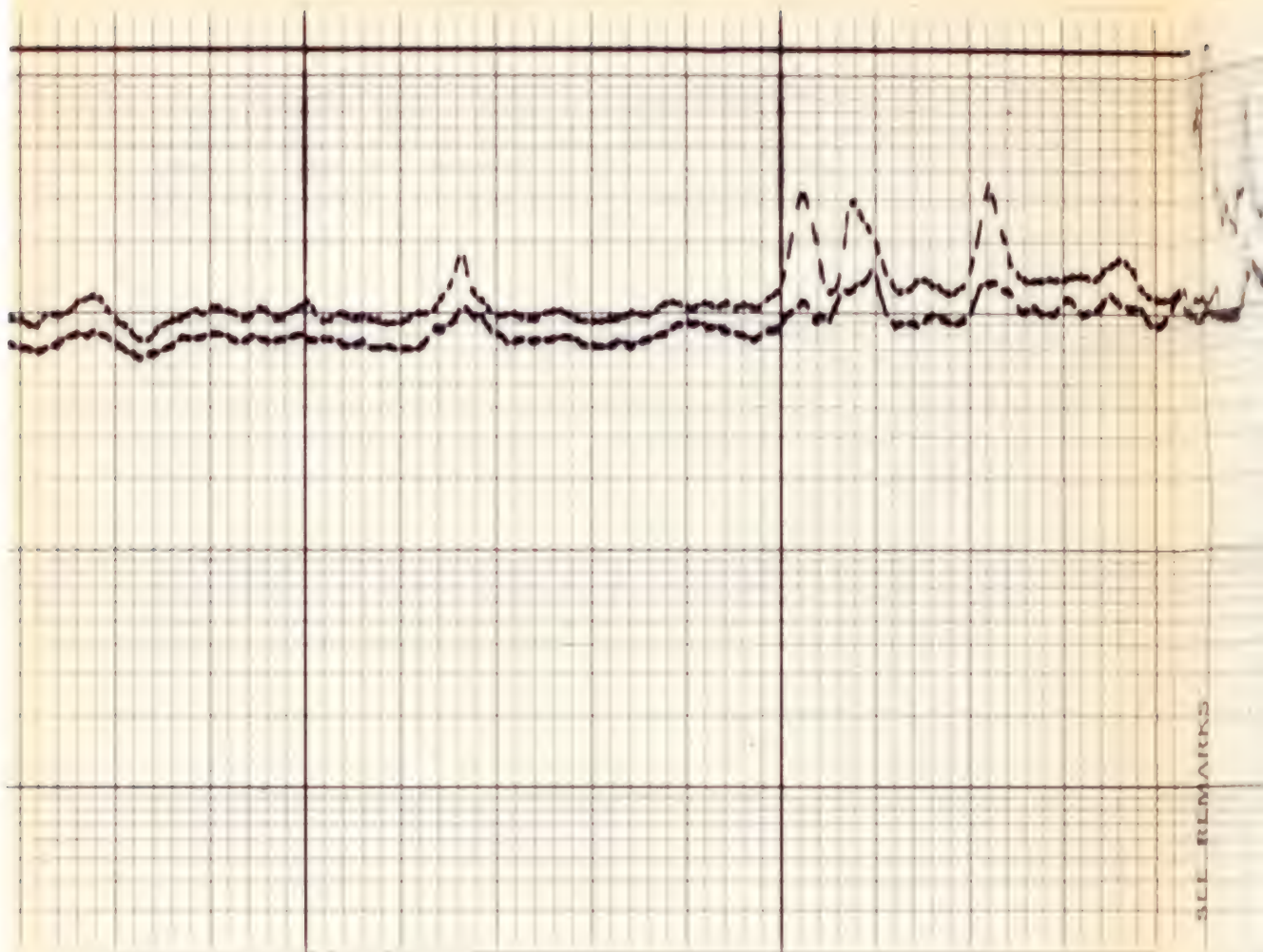




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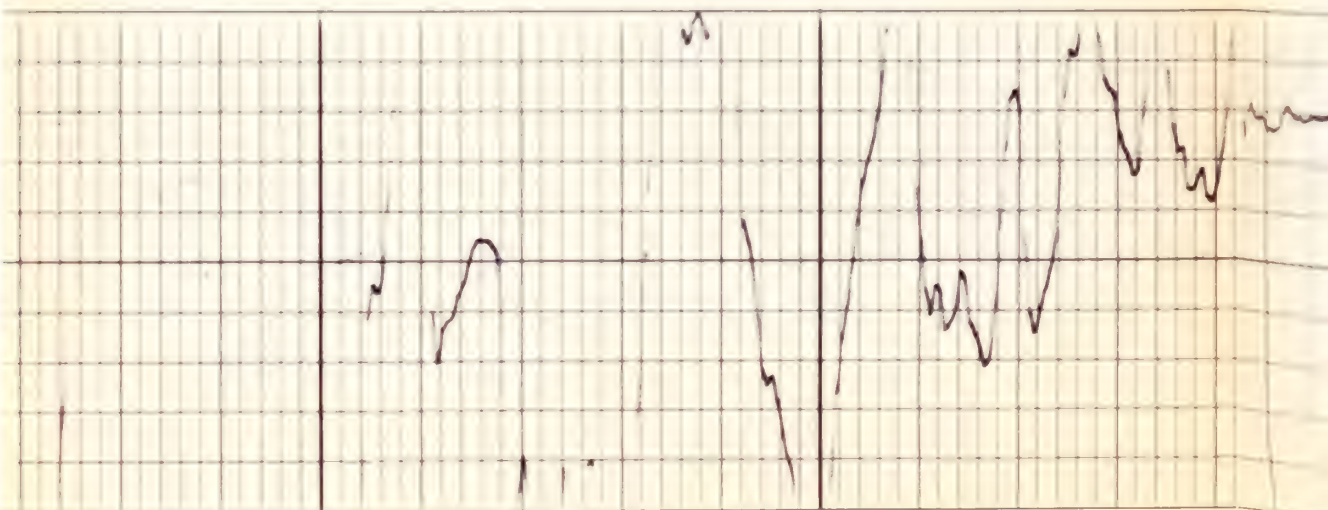
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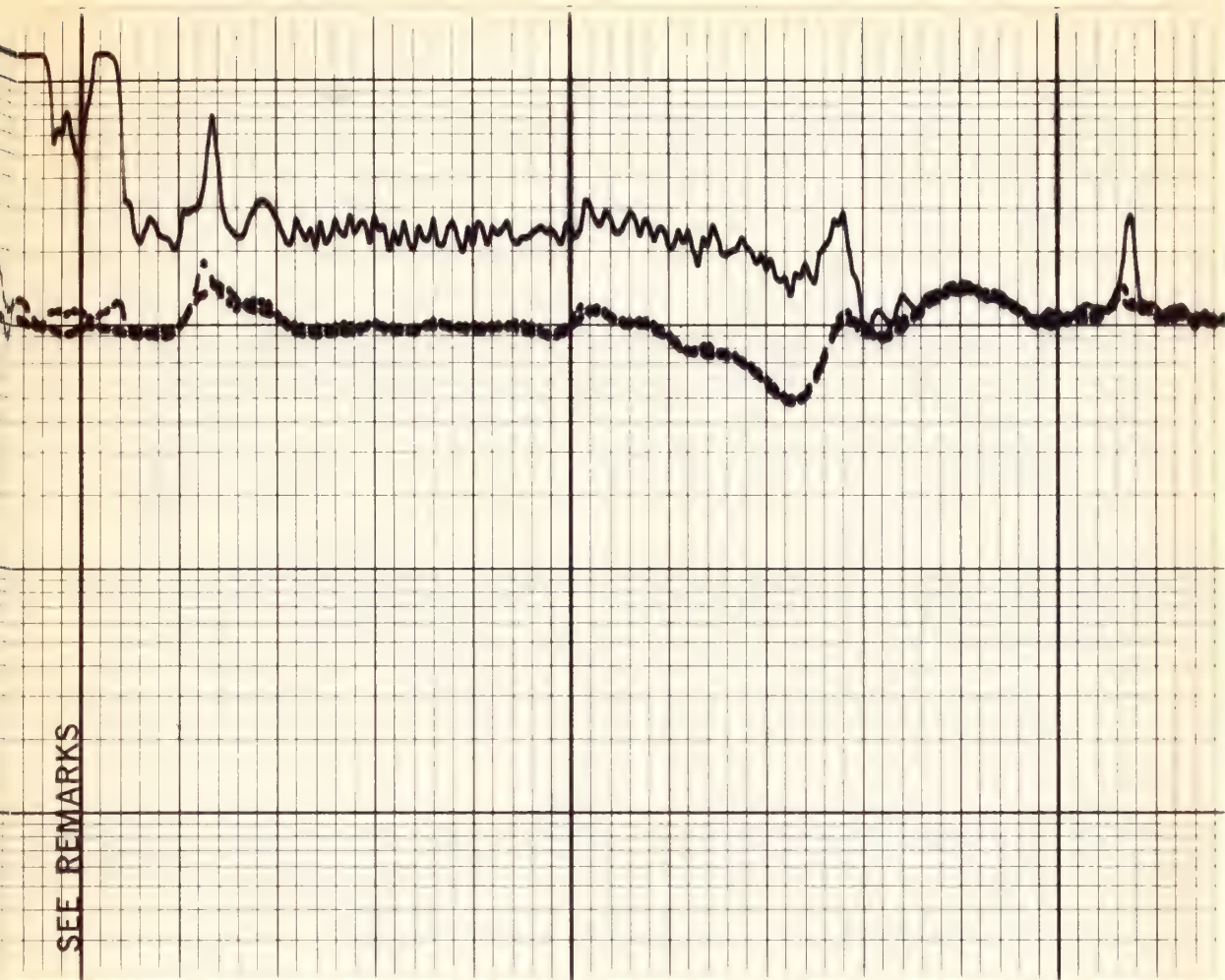


ENCLOSURE 11

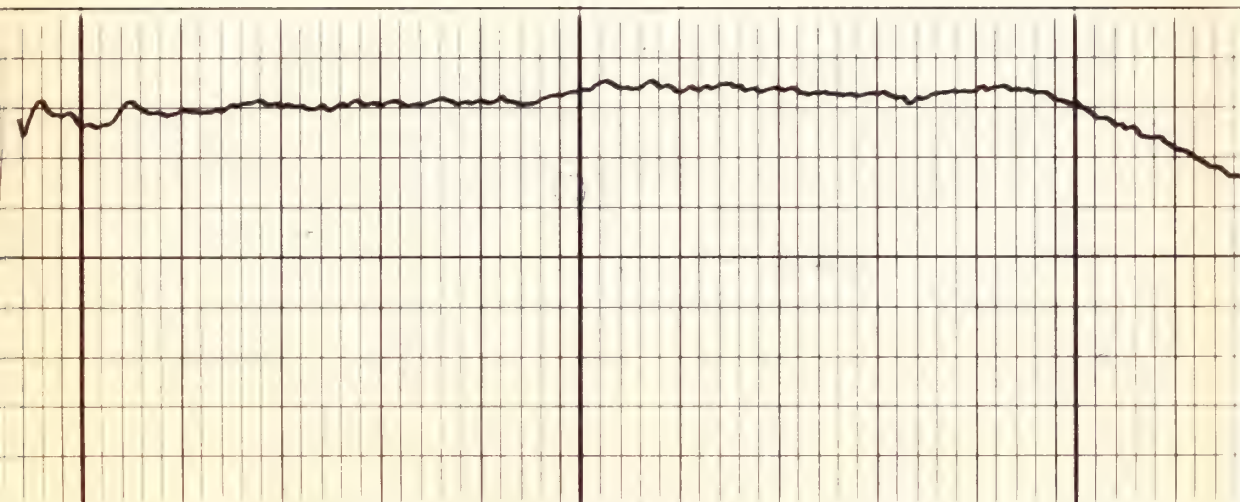
0400

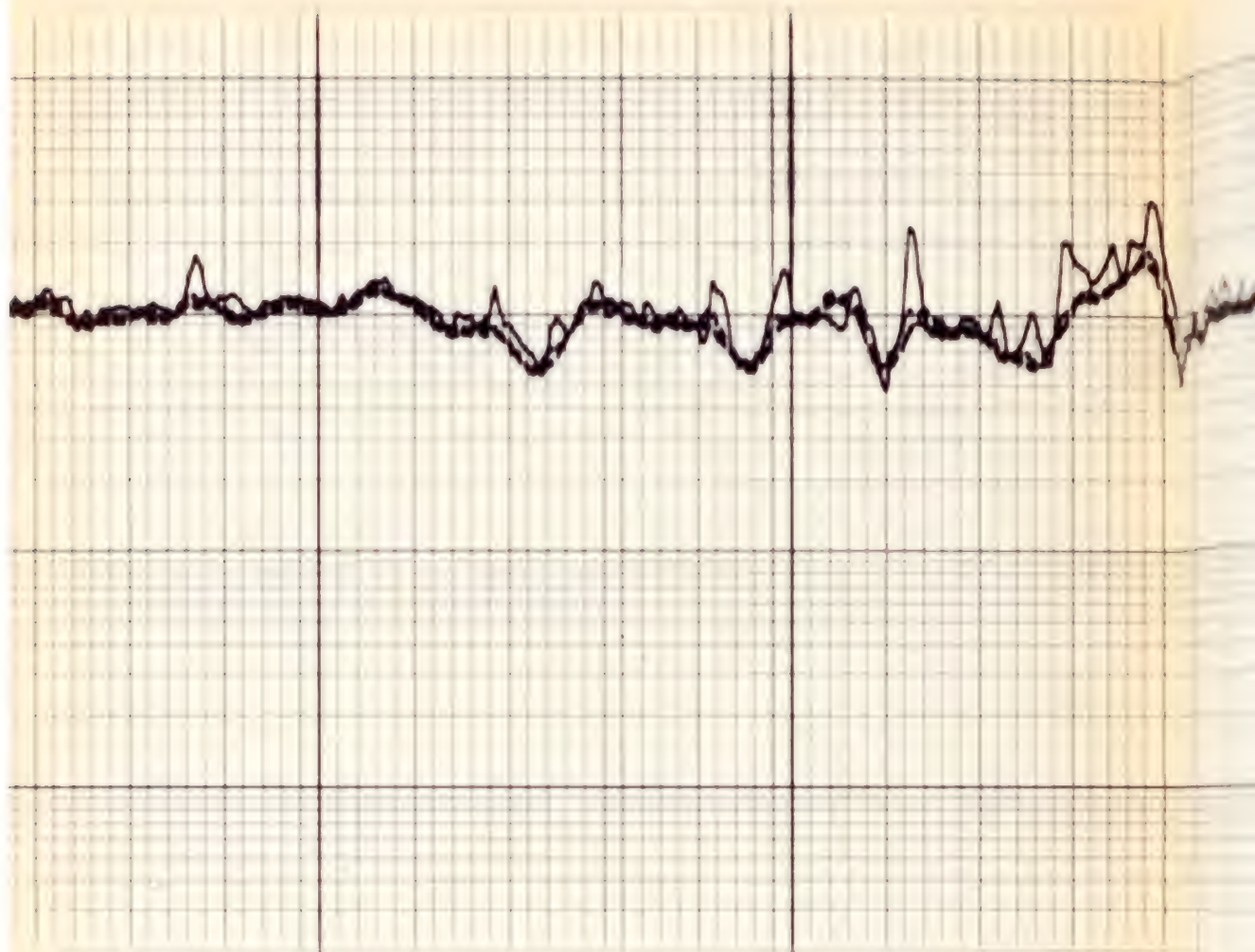


SEE REMARKS

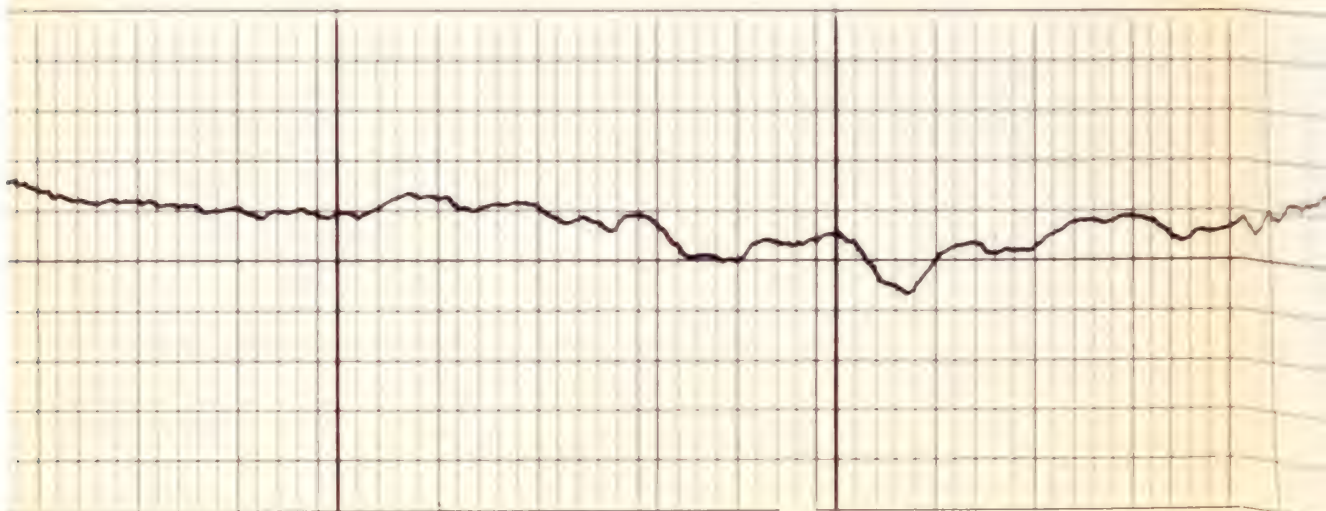


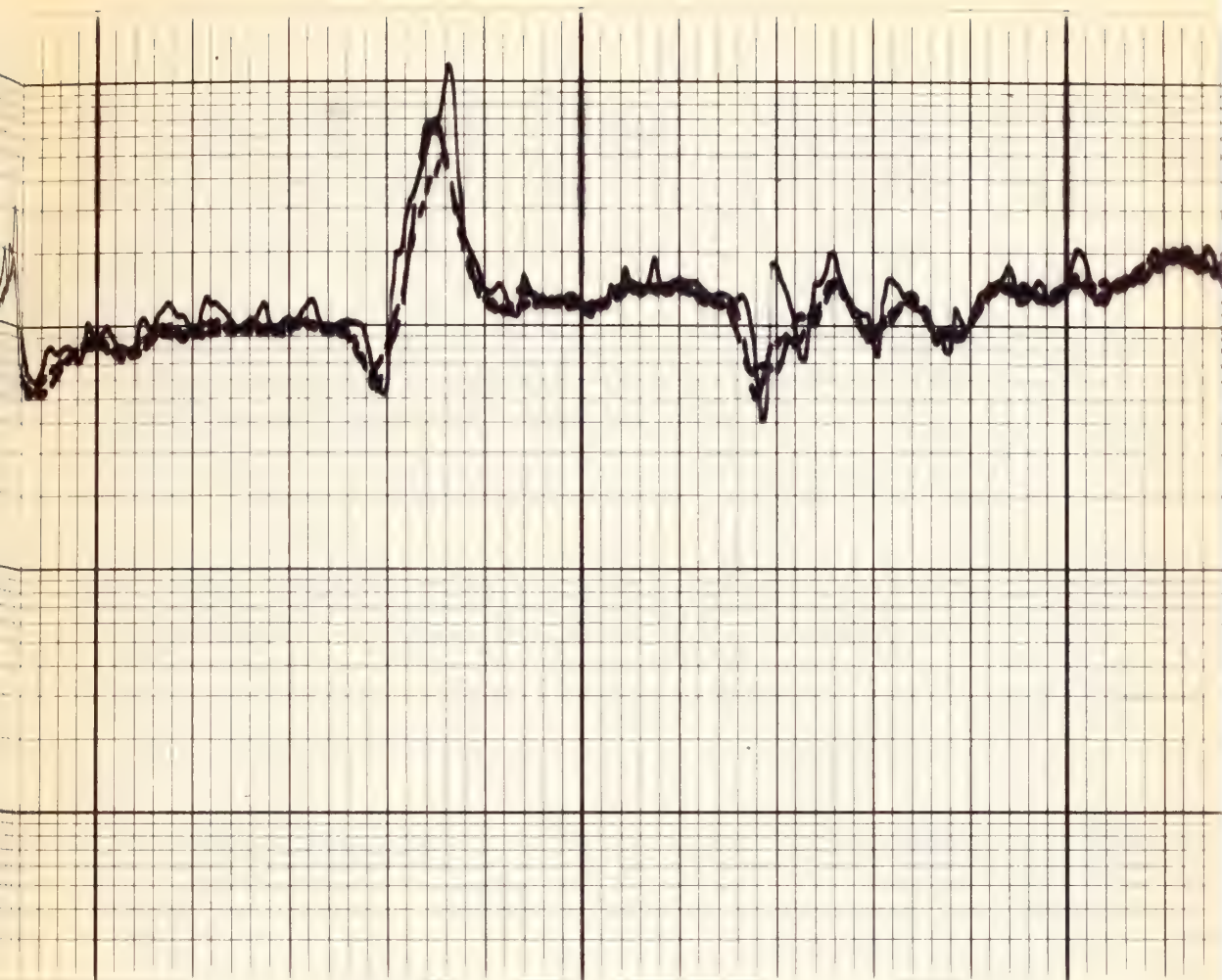
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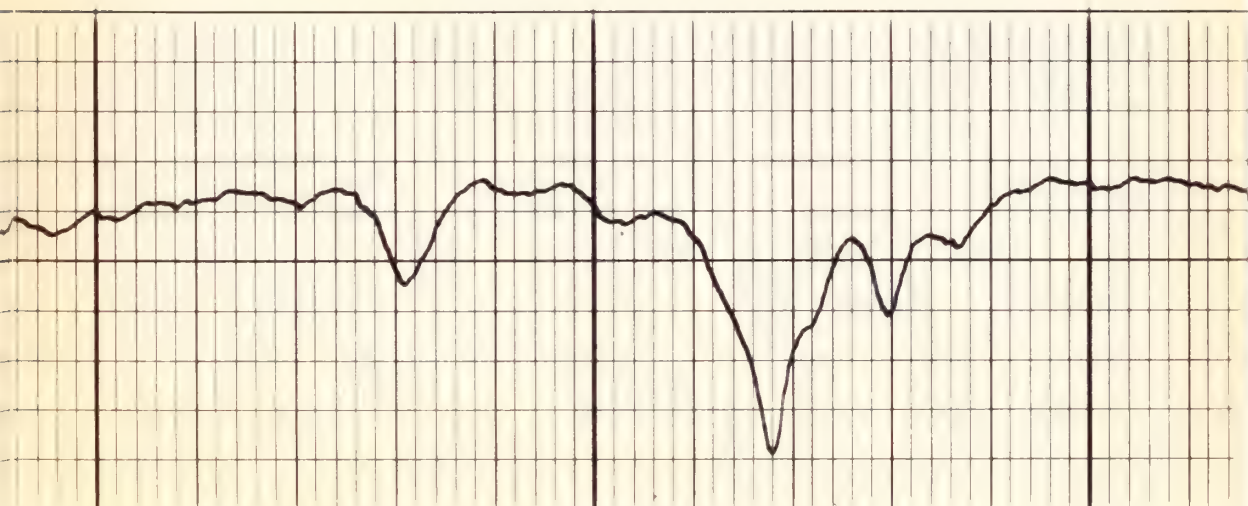
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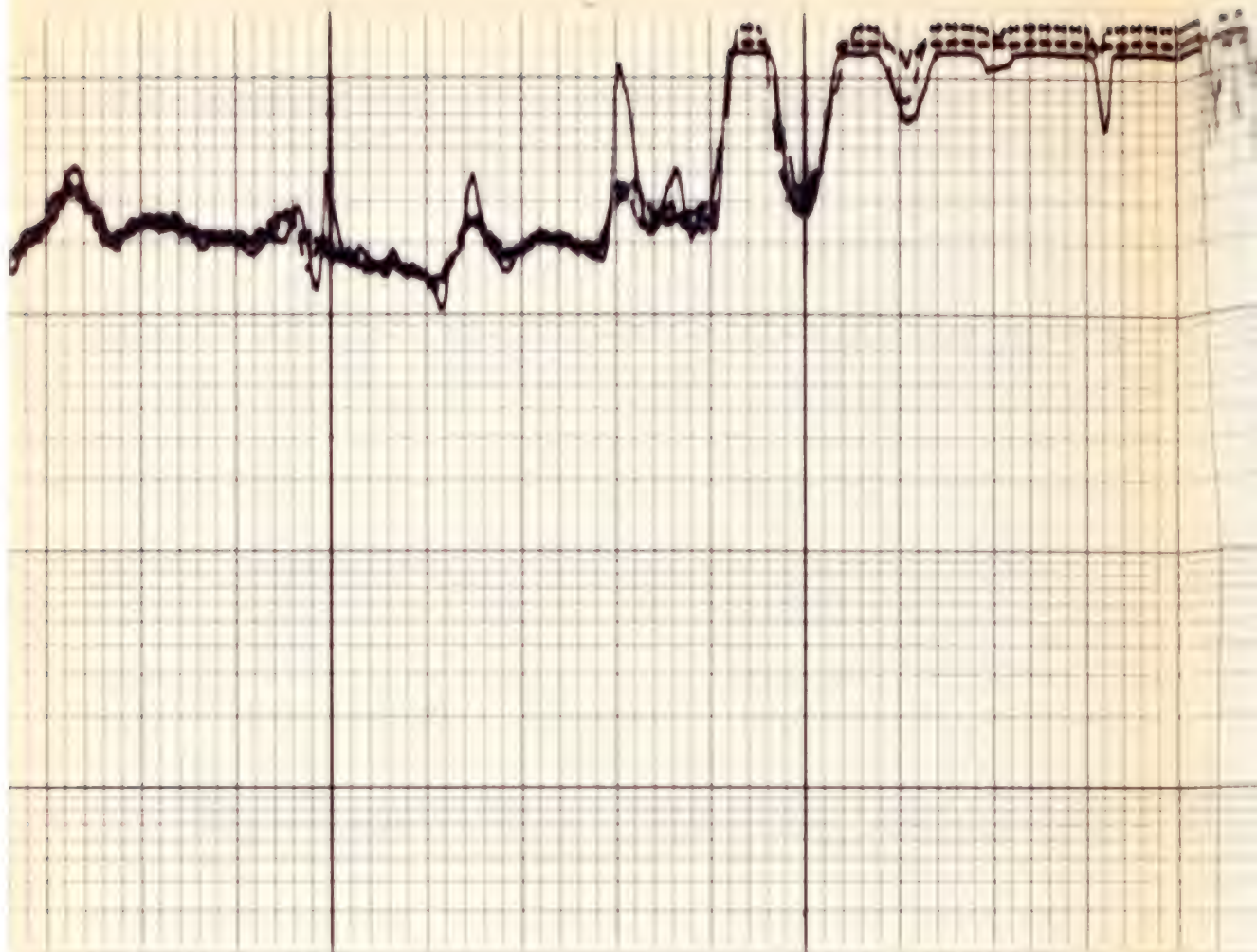




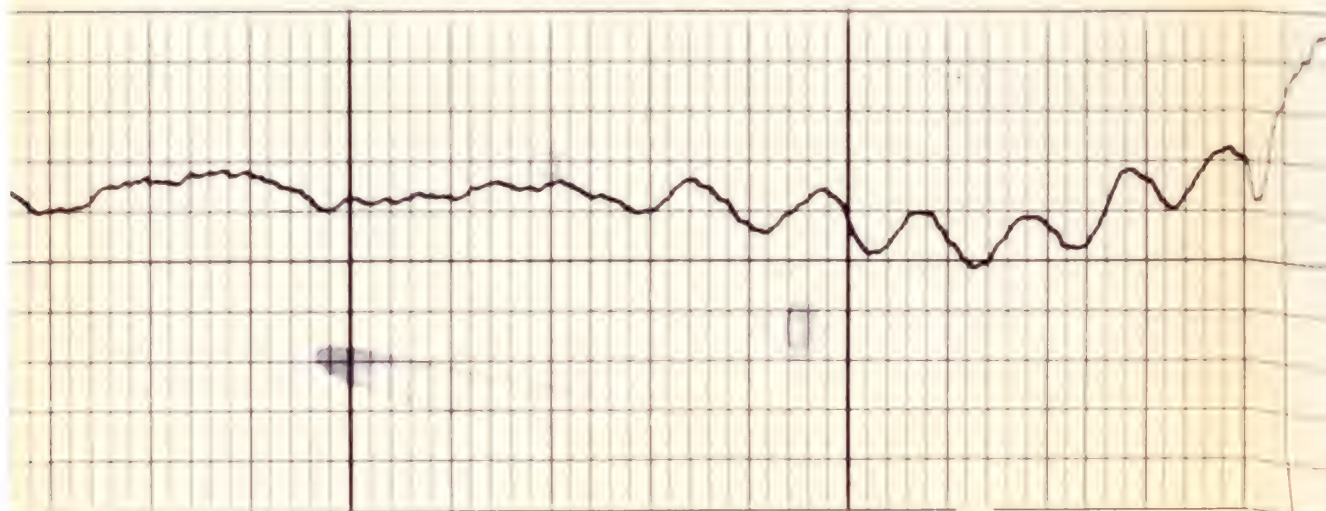
0700

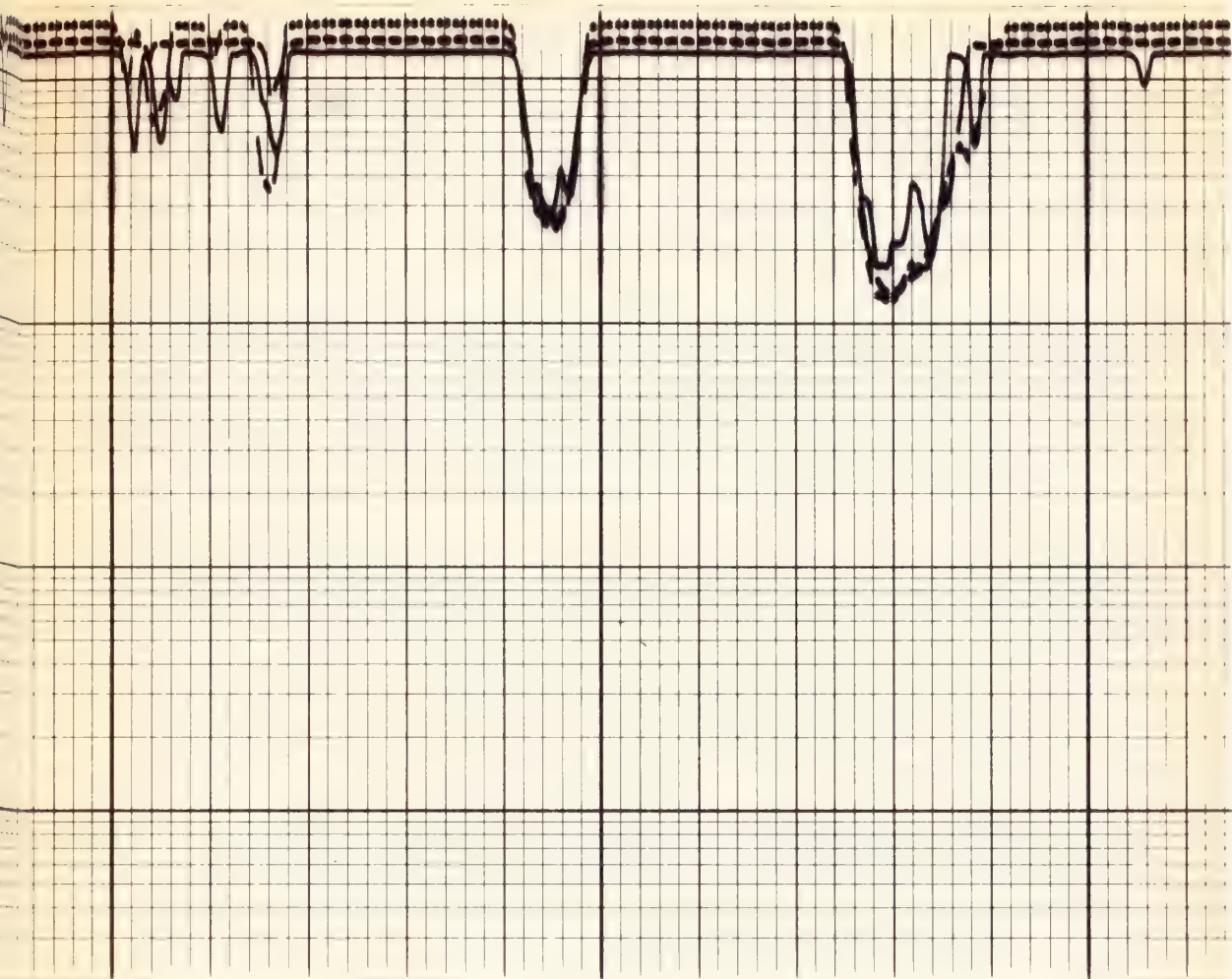
0800



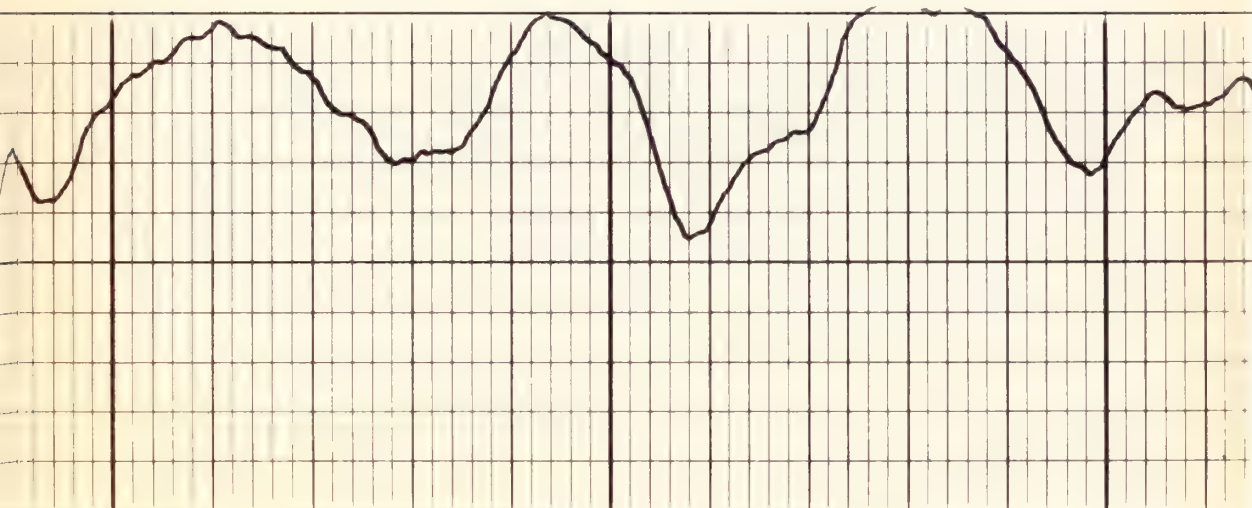


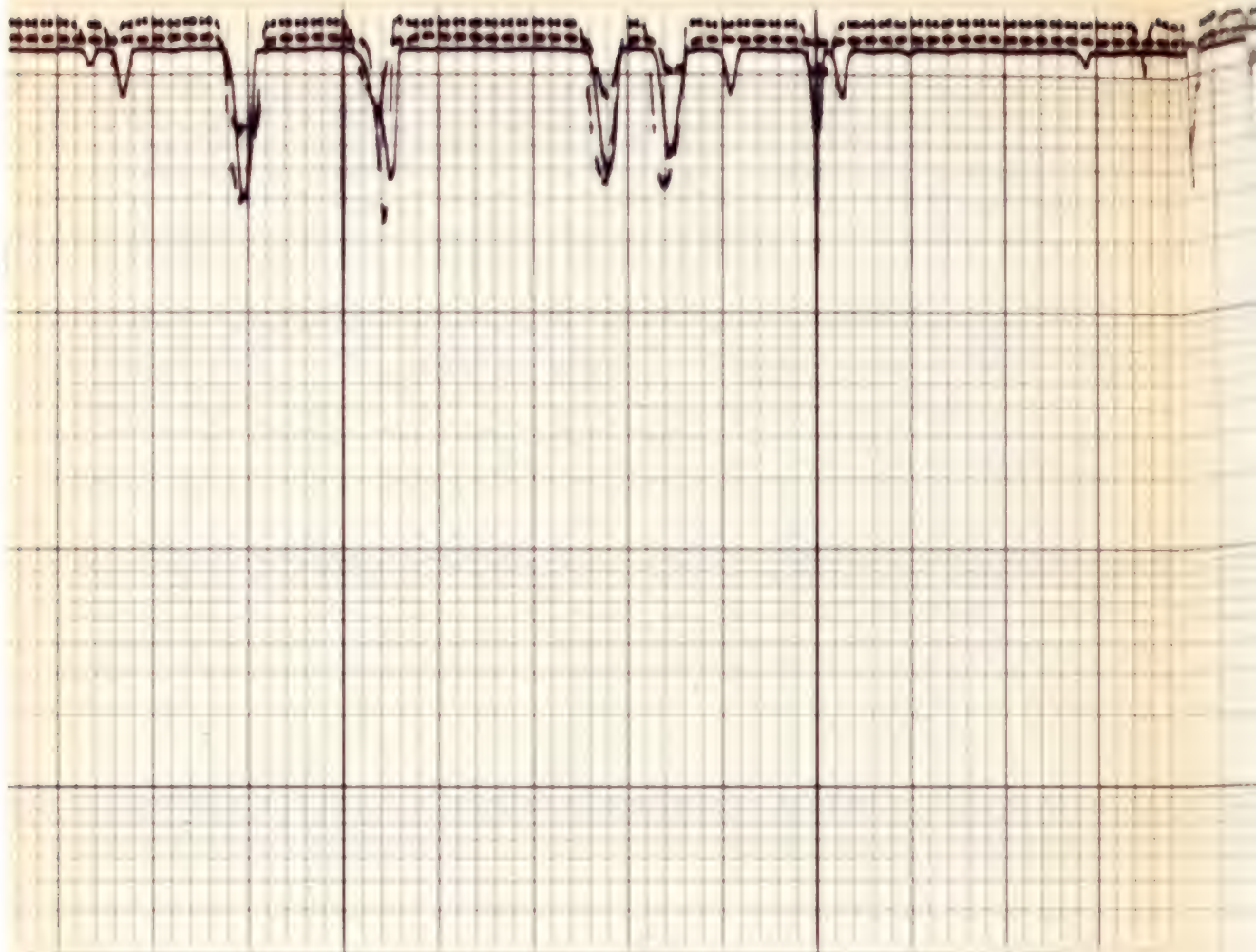
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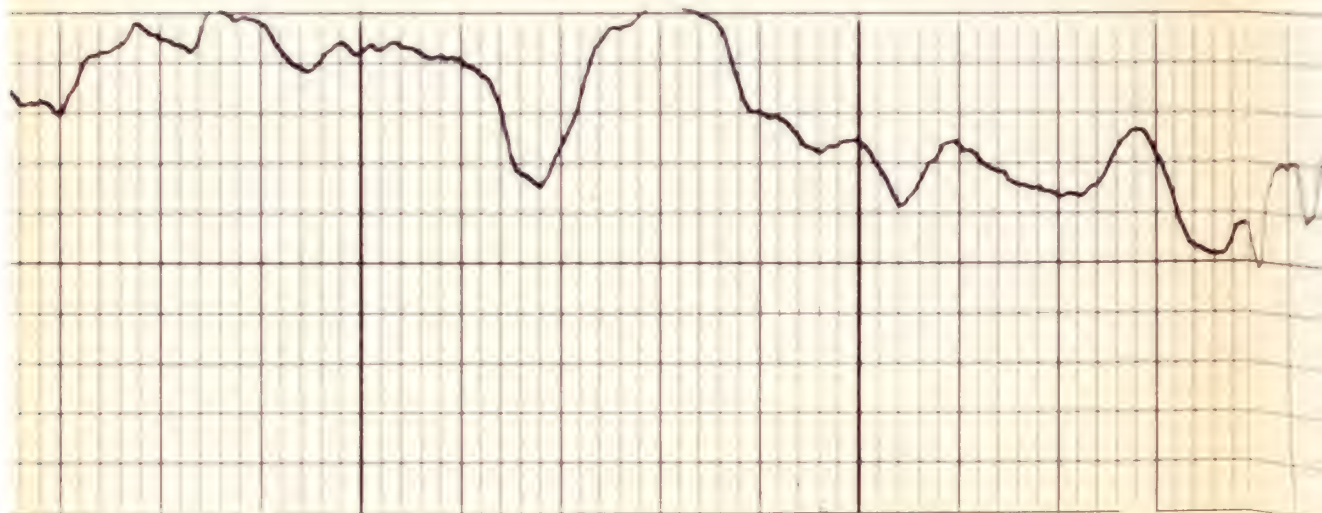
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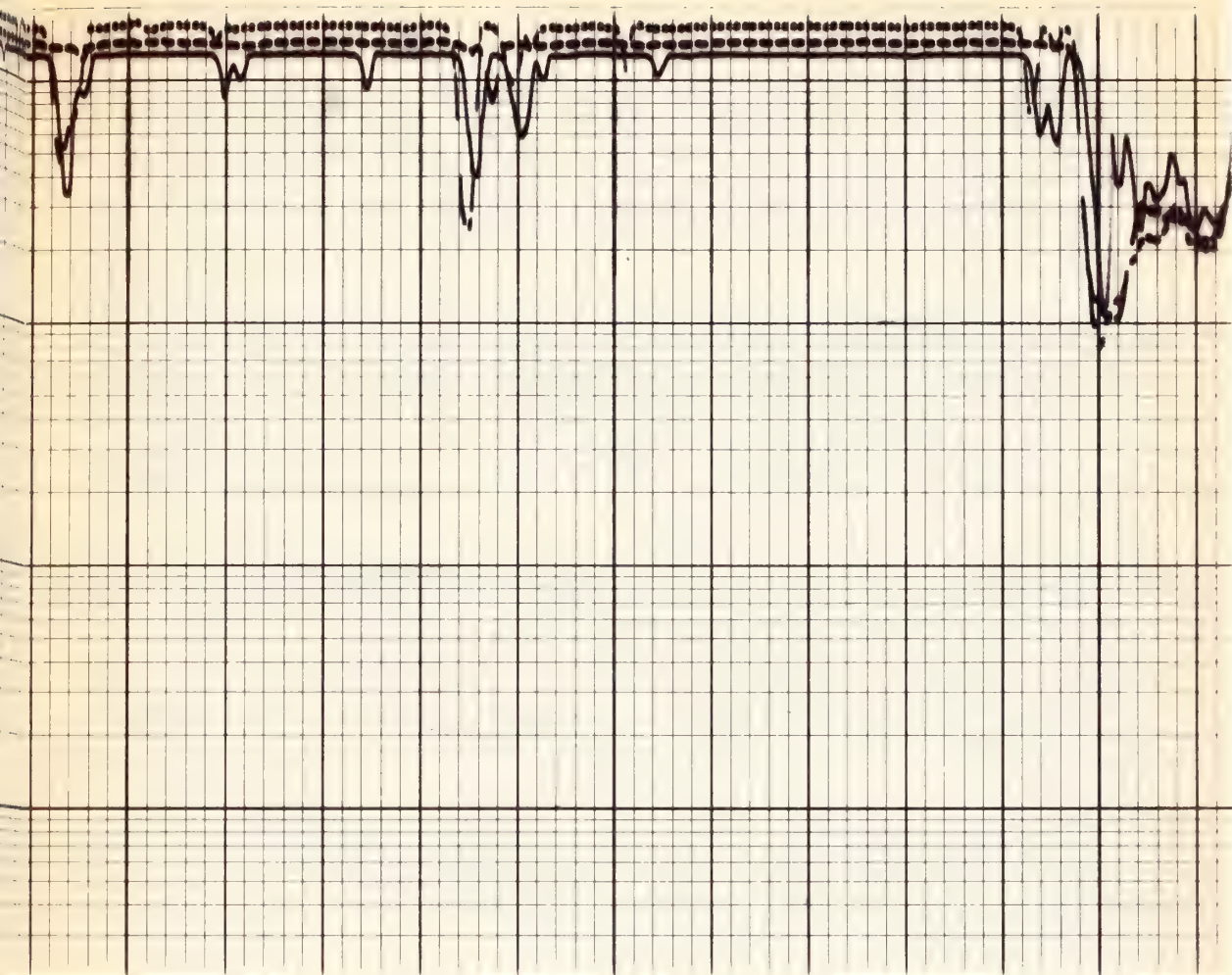




MOO

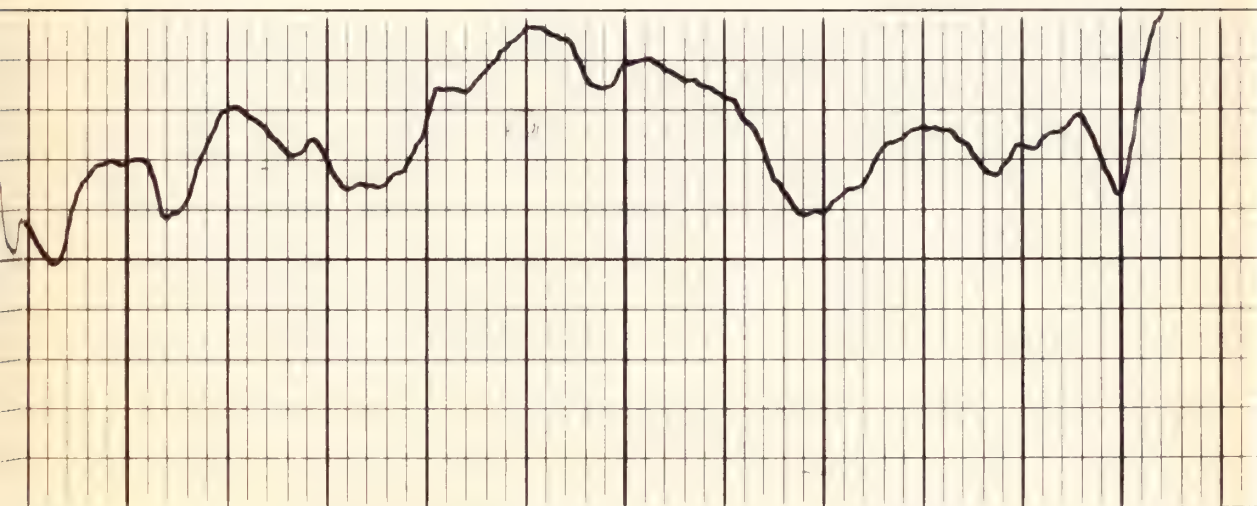
200

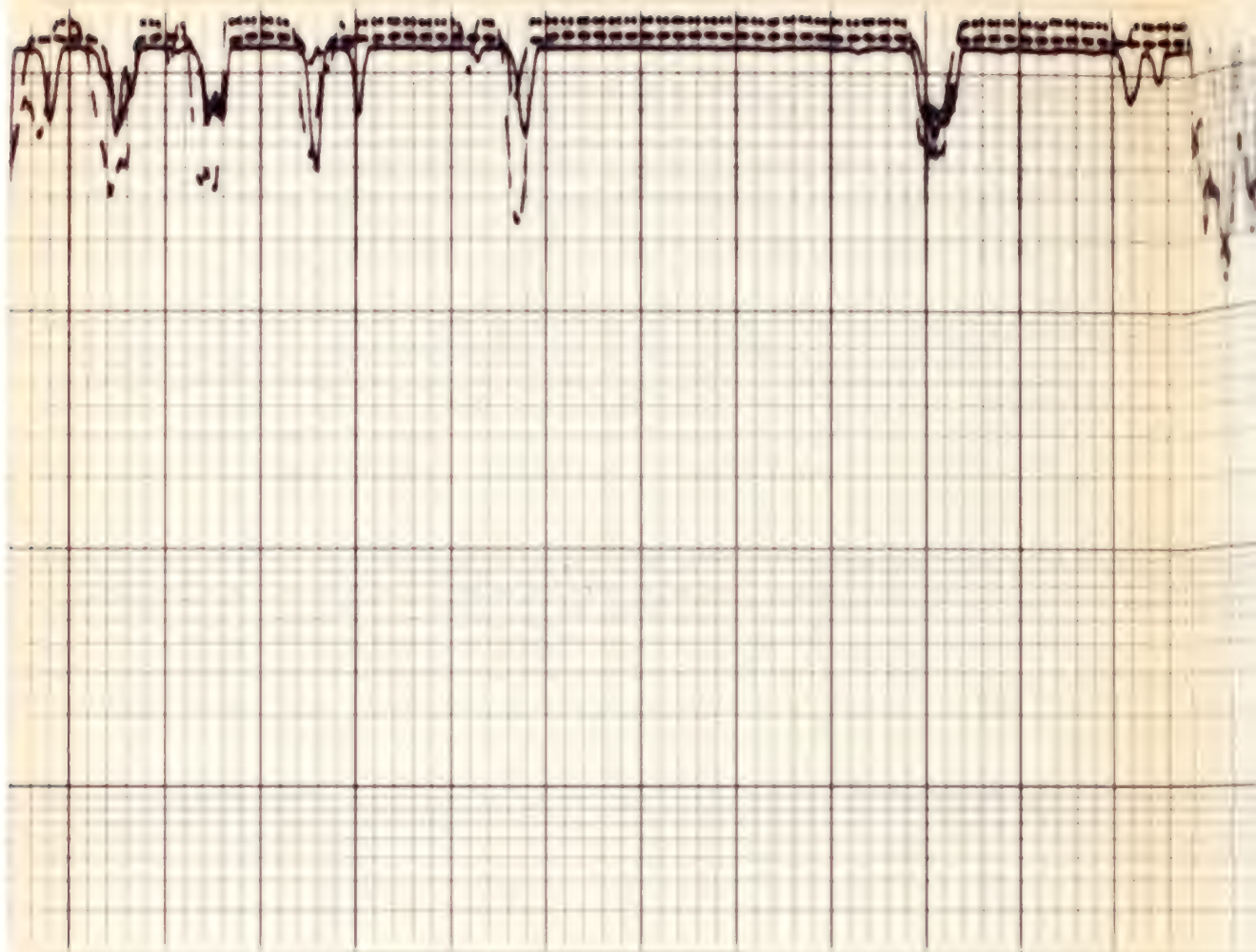




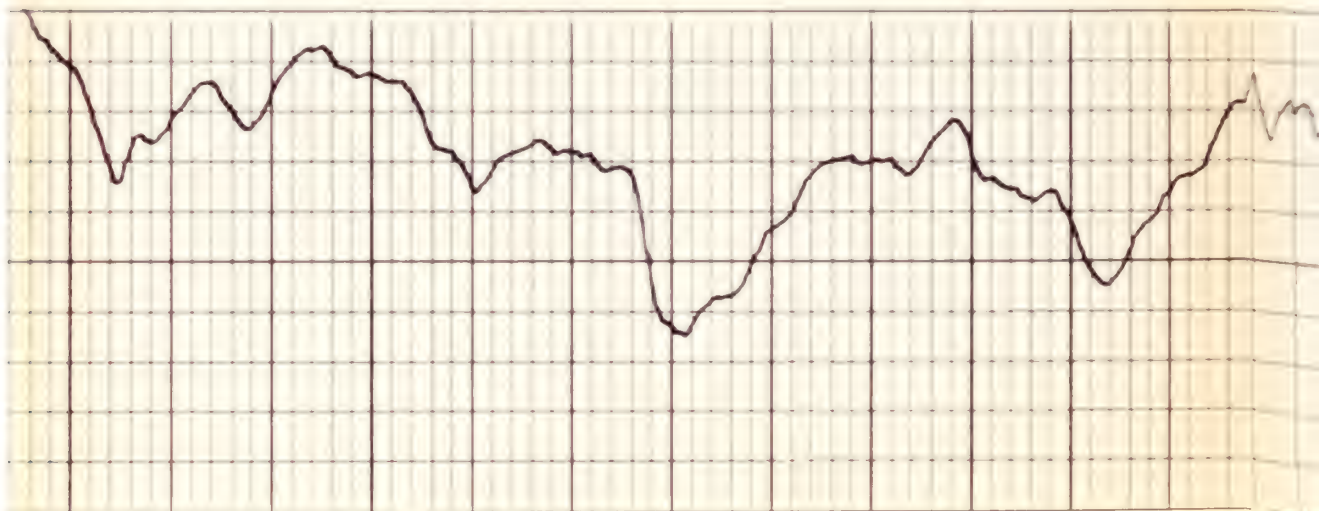
1200

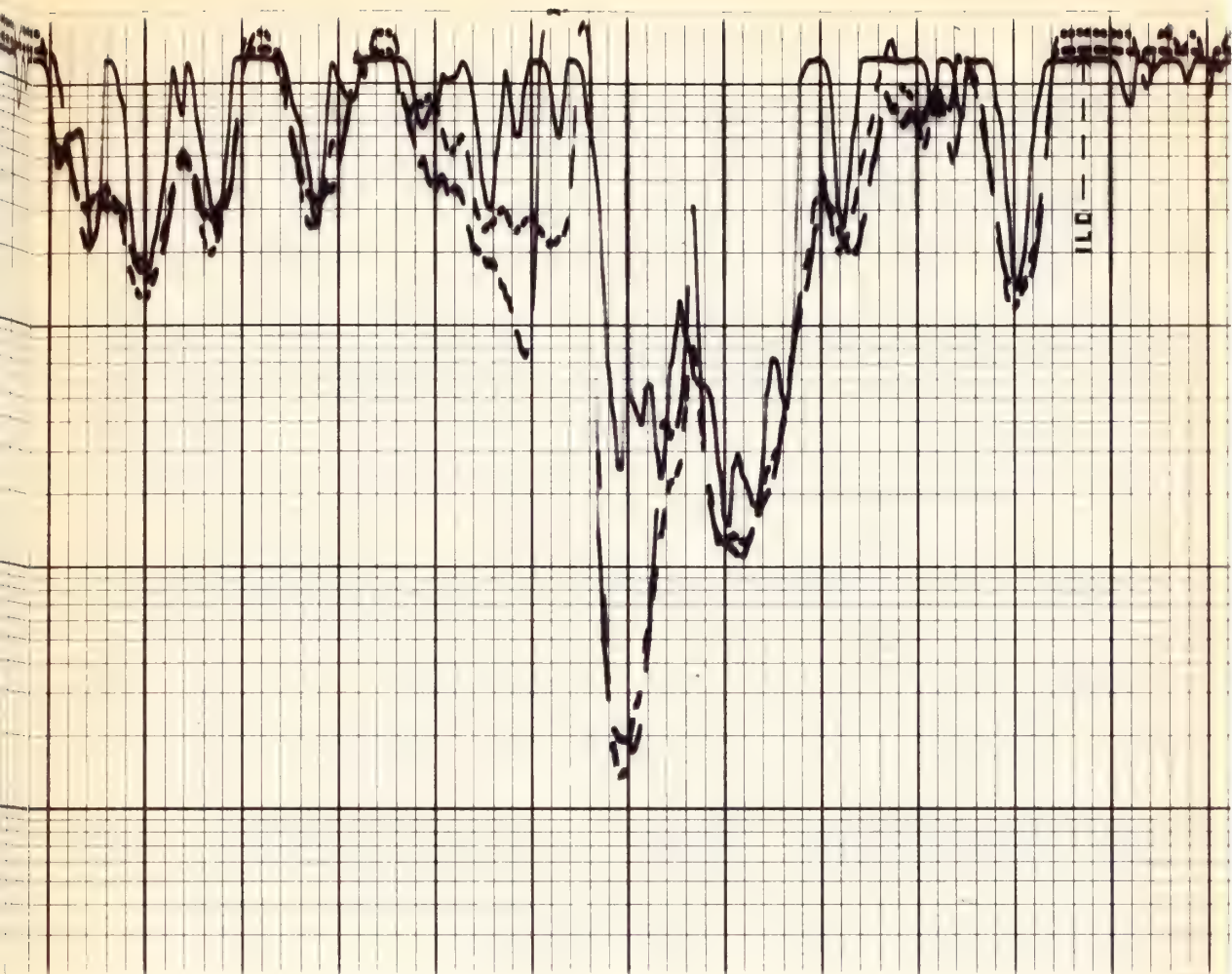
1300



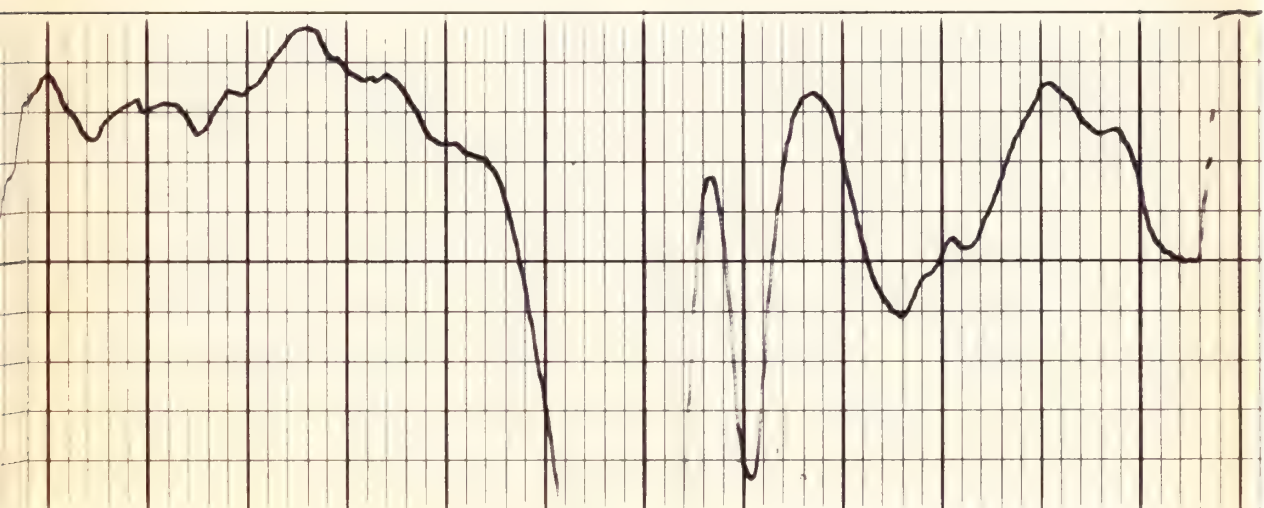


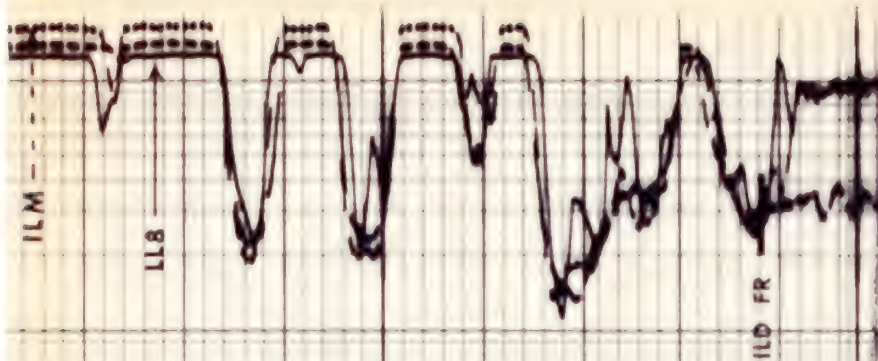
400



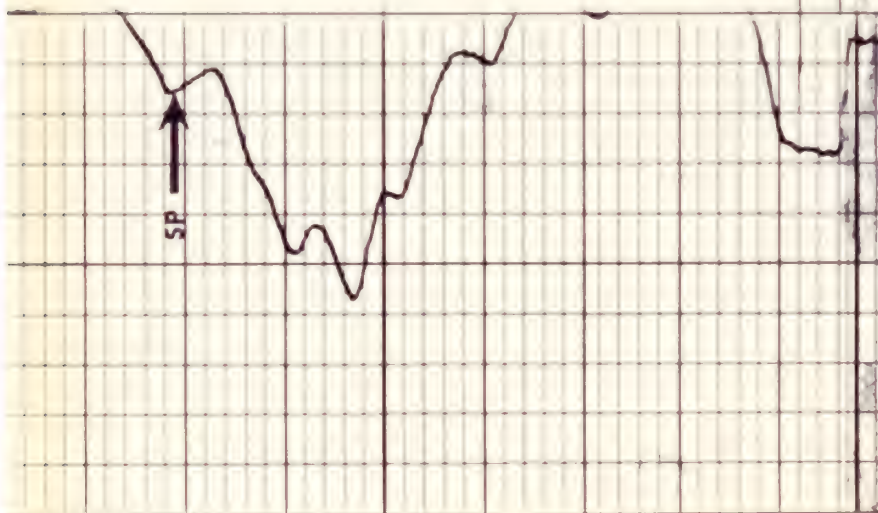


1500





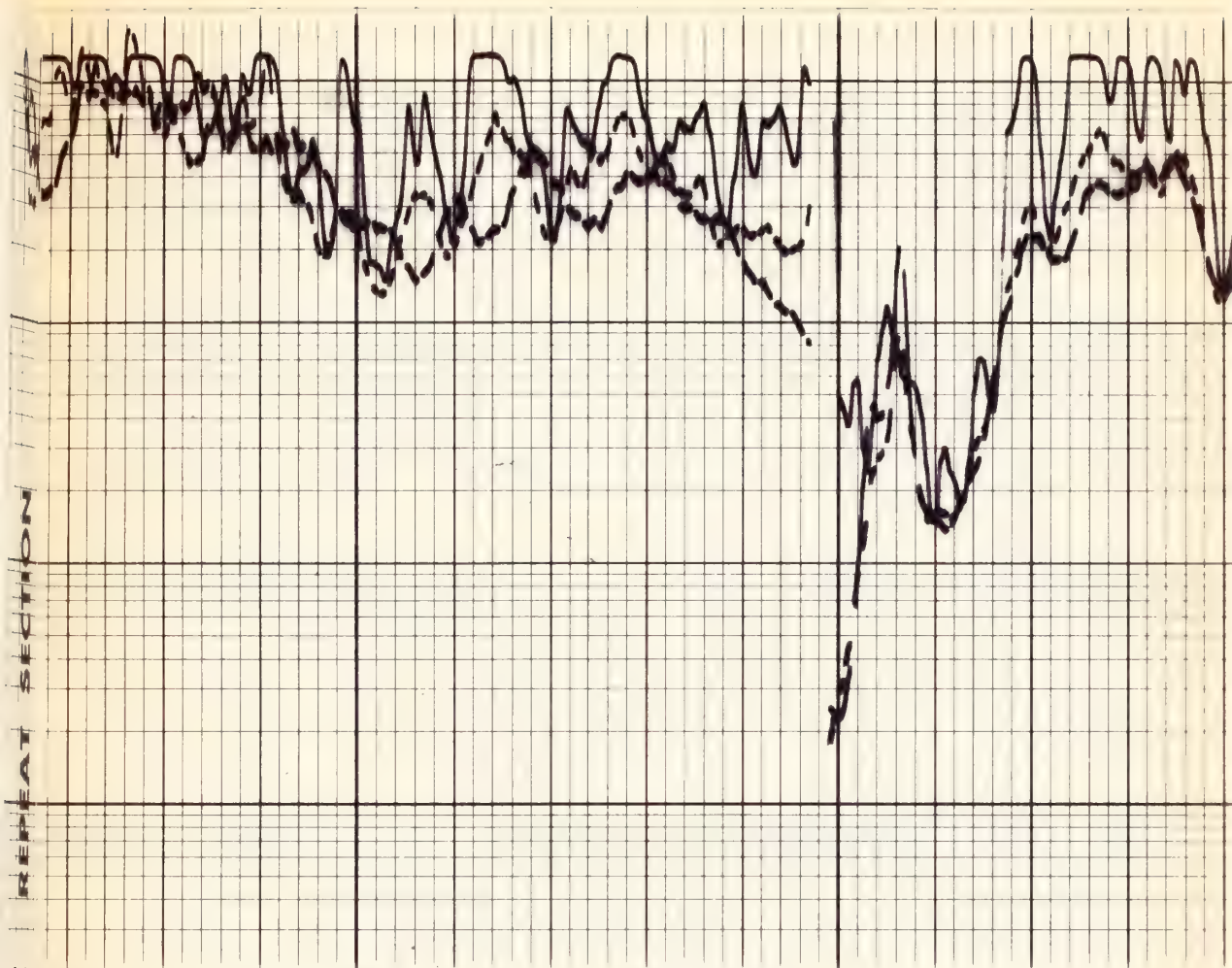
1600



REPEAT SECTION

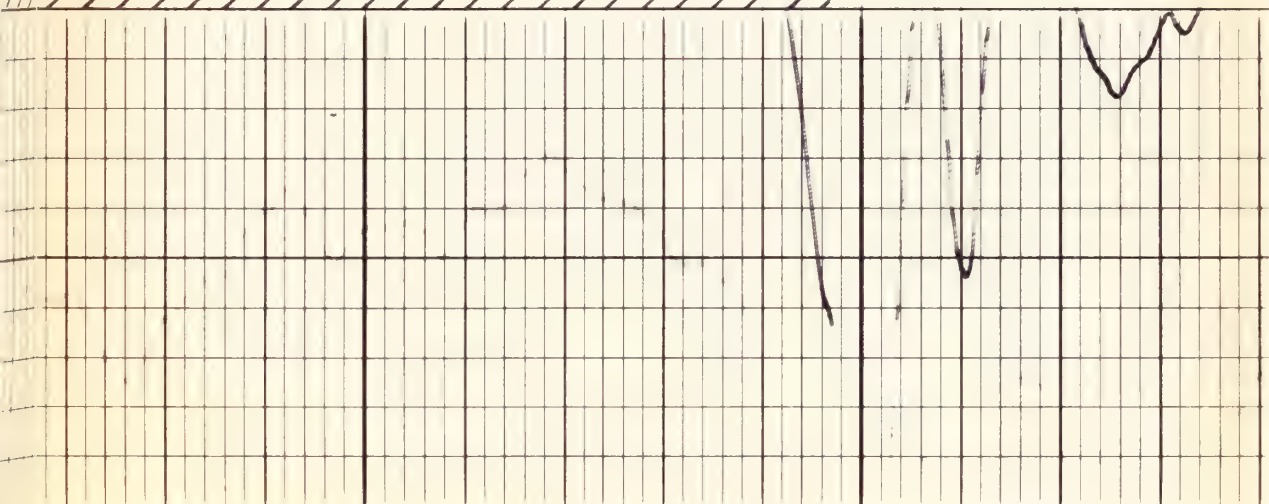


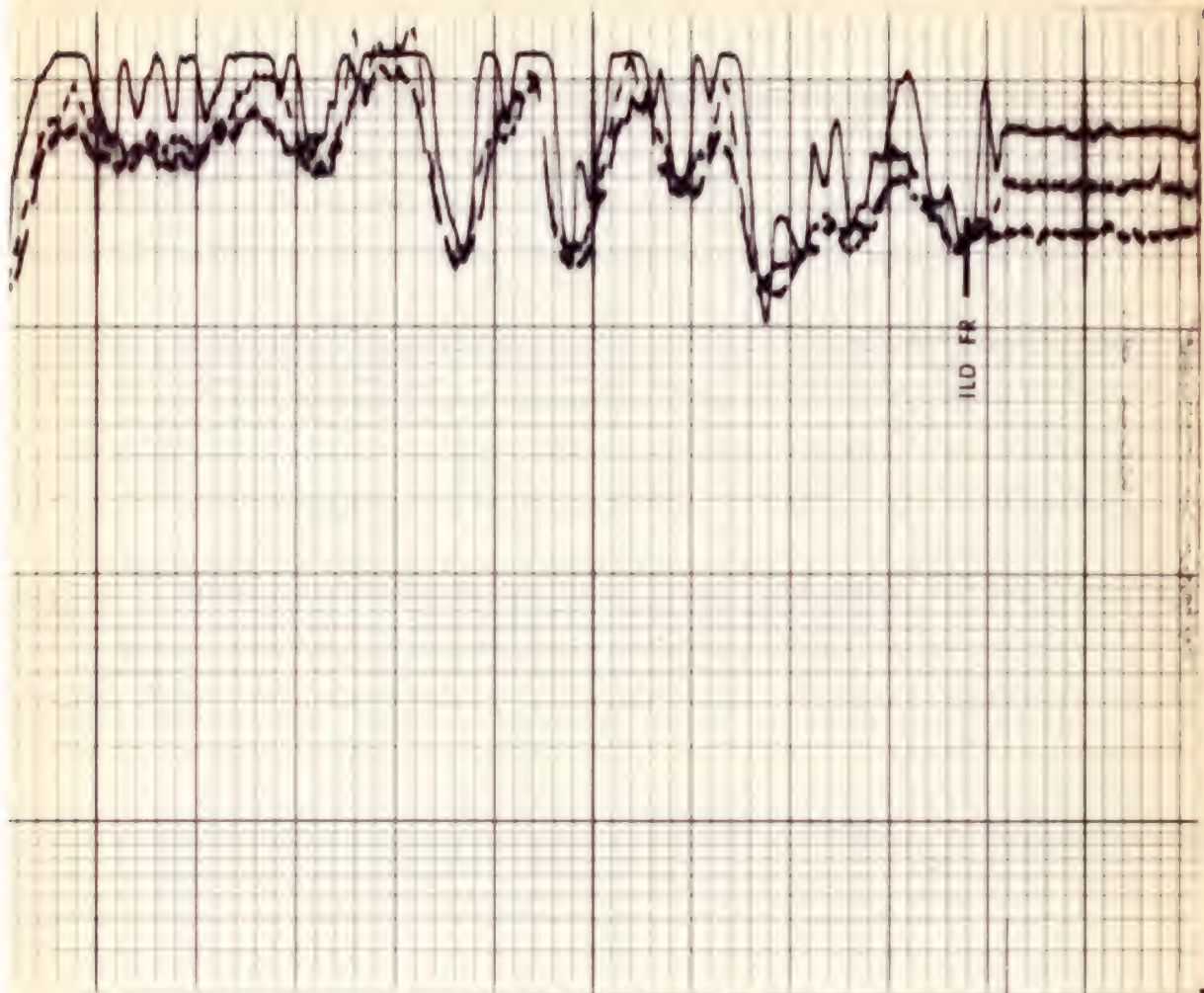
REPEAT SECTION



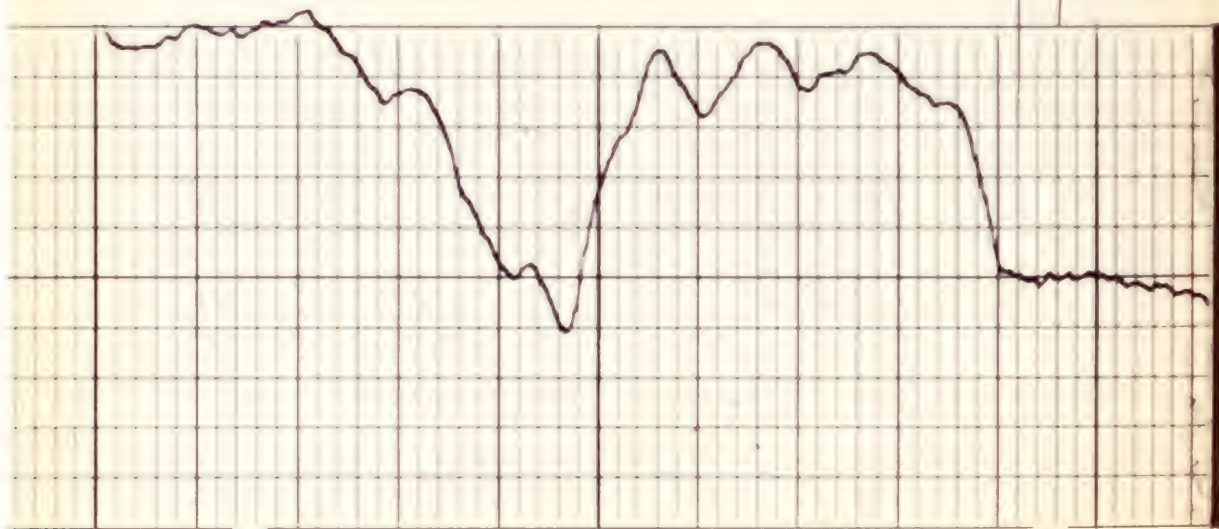
MEMORIZER OUT — CURVES INVALID

1500





1600





— $\frac{10}{MV}$ +

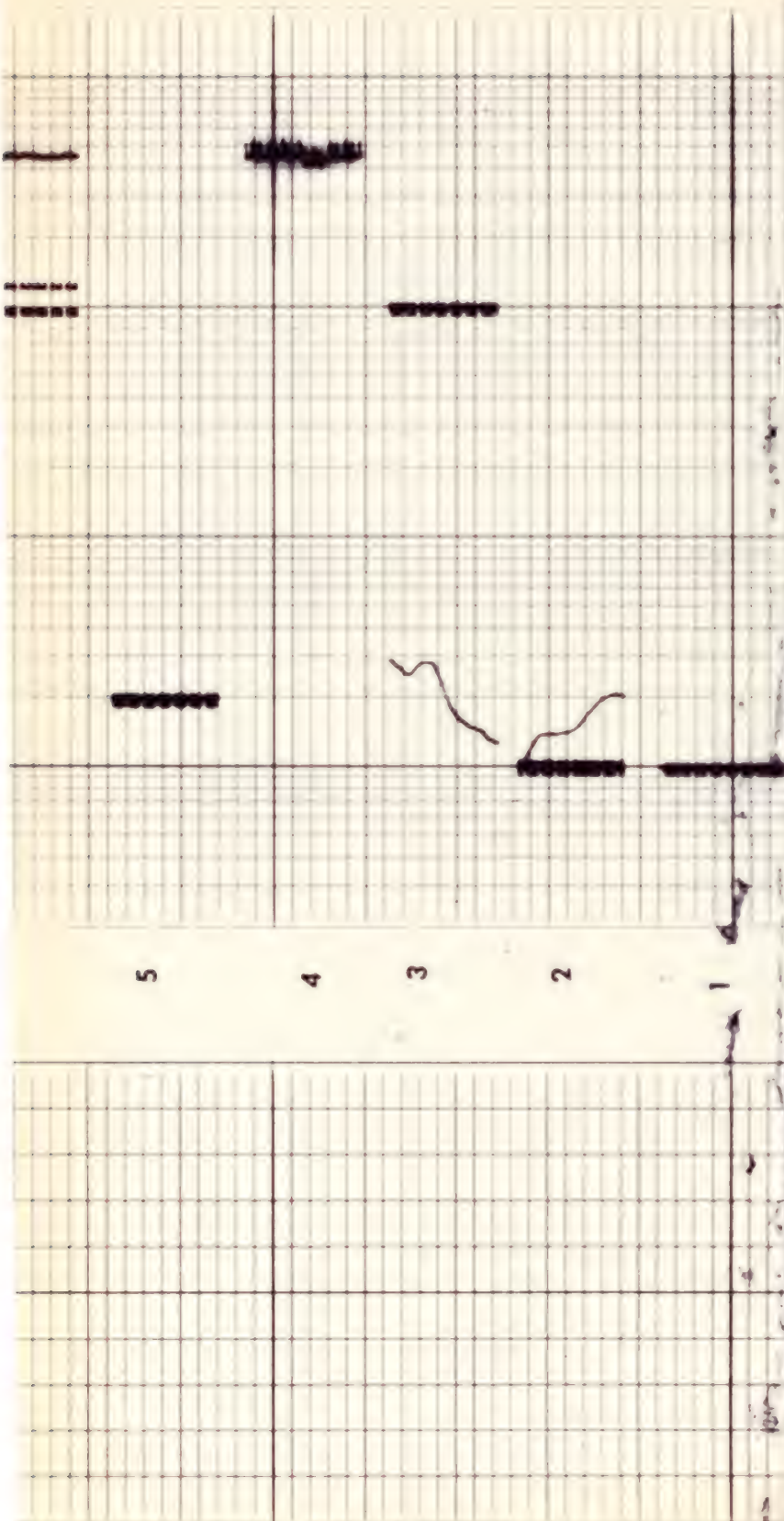
| SPONTANEOUS-POTENTIAL MILLIVOLTS | DEPTHS | RESISTIVITY OHMS. M ² /M |
|-------------------------------------|--------|--|
|-------------------------------------|--------|--|

| | | | |
|---------|--------------------------------|----------|------|
| COMPANY | THE ATLANTIC RICHFIELD COMPANY | SCHL. FR | 1642 |
| WELL | AQUIFER TEST #1-C | SCHL. TD | 1646 |
| FIELD | SORGHUM GULCH | DRLR TD | 1640 |
| COUNTY | RIO BLANCO | Elev: | |
| | STATE COLORADO | KB | |
| | | DF | |
| | | GL | 6909 |

CALIBRATION RECORD

Calibration after Survey

6



CALIBRATION RECORD

| | | |
|---|--|--|
| COMPANY <u>THE ATLANTIC RICHFIELD COMPANY</u> | SCHL. FR <u>1642</u> SCHL. TD <u>1646</u> DRLR TD <u>1640</u> Elev: _____ KB _____ DF <u>6000</u> | COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> |
| WELL <u>AQUIFER TEST #1-C</u> | FIELD <u>SORGHUM GULCH</u> | |

WELL ID 1640
DRILLER
ELEV
SP
GL 6909

WELL #1-C
FIELD SORGHUM GULCH
COUNTY RIO BLANCO
STATE COLORADO

Schlumberger**ORIENTED PERFORATING RECORD
AND CASING COLLAR LOG**

| | | |
|---|--|---|
| COUNTY <u>RIO BLANCO</u> FIELD or LOCATION <u>SORGHUM GULCH</u> WELL <u>AT-1D</u> COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | |
| | WELL <u>AT-1D</u> | |
| | FIELD <u>SORGHUM GULCH</u> | |
| | COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> | |
| Location: <u>1515 W. LINE -</u> <u>1511 S. LINE</u> Sec. <u>7</u> Twp. <u>3S</u> Rge. <u>96W</u> | | Other Services: <u>CBL-GR</u> <u>VDL-CCL</u> |
| Permanent Datum: <u>GROUND LEVEL</u> ; Elev.: <u>6903</u> Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum Drilling Measured From <u>GL</u> | | Elev.: K.B. <u>----</u> D.F. <u>----</u> G.I. <u>6903</u> |

| | |
|------------------------|--------------------------|
| Date | <u>10/3/74</u> |
| Run No. | <u>ONE</u> |
| Pipe String No. | <u>NO.1 & NO.2</u> |
| Pipe String Ident. | <u>LONG & MIDDLE</u> |
| Type Orienting | <u>POWERED</u> |
| | |
| Type fluid in hole | <u>WATER</u> |
| Salinity, PPM Cl. | <u>----</u> |
| Density | <u>----</u> |
| Level | <u>FULL</u> |
| Max rec. temp., deg F. | <u>----</u> |
| Operating rig time | <u>----</u> |
| Recorded by | <u>ST. AUBYN</u> |
| Witnessed by | <u>MR. BARRET</u> |

| BORE-HOLE RECORD | | | CEMENTING RECORD | | | |
|------------------|------|----|------------------|---------|------|----|
| Bit | From | To | Type | Wgt. | From | To |
| 7 7/8 | 60 | TD | Primary | HOWCO | 795 | TD |
| | | | Squeeze | LT. WT. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

The well name, location and borehole reference data were furnished by the customer.

| EQUIPMENT DATA | | | | DEPTHS RELATE TO | | CASING COLLARS | |
|-----------------|--------|--------------|----------|------------------|--|----------------|--|
| Hoist Truck No. | 3862 | Rotator Size | 1 11/16" | | | | |
| Inst. Truck No. | 3862 | Rotator No. | | | | | |
| Tool Serial No. | 11 | Indexer Type | | | | | |
| Location | VERNAL | Indexer No. | | | | | |

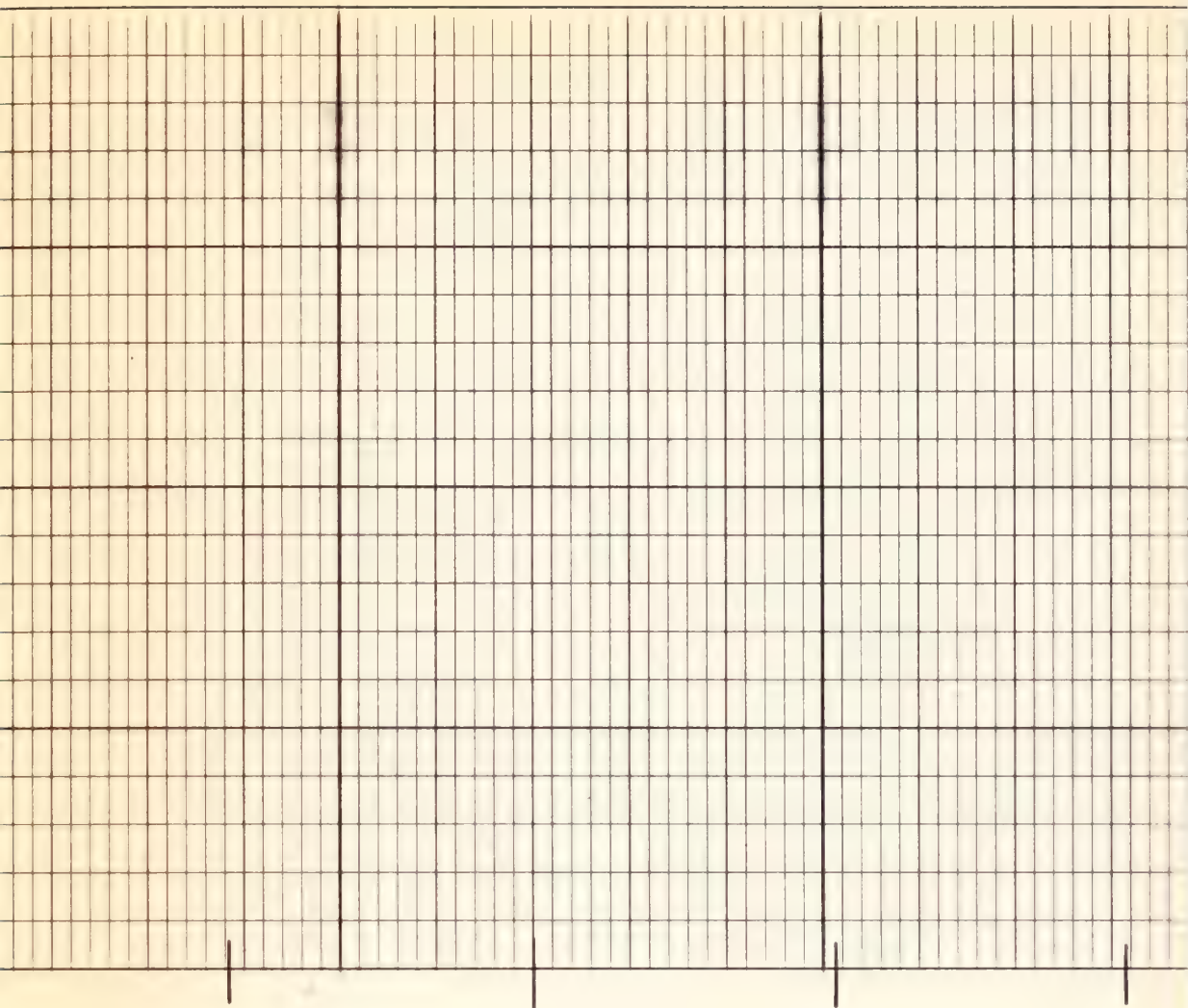
| PERFORATING DATA | | | | LOGGING DATA | | | | PIPE STRING RECORD | | | |
|-----------------------|------|-------|---------|--------------|---------|-------|--------|--------------------|-------|--------|-------|
| Depths | | No. | Gun | Time | Sens. | Zero | Calib. | Colib. | | Colib. | |
| From | To | Shots | Size | Const | Setting | Shift | Sens | Defl. | Defl. | Defl. | Defl. |
| NO. 1 - LONG STRING | | 45 | 1 11/16 | HYPERDOME | | | | | | | |
| 1435 | 1480 | | | | | | | | | | |
| NO. 2 - MIDDLE STRING | | | | | | | | | | | |
| 1050 | 1300 | 251 | 1 11/16 | HYPERDOME | | | | | | | |

| | | | | |
|----------------|-------|--------|-------|---|
| Number | 1 | 2 | 3 | 4 |
| Identification | LONG | MIDDLE | SHORT | |
| Size | 2 3/8 | 2 3/8 | 2 3/8 | |
| Weight | 4.7 | 4.7 | 4.7 | |
| Depth | 1640 | 1441 | 1079 | |

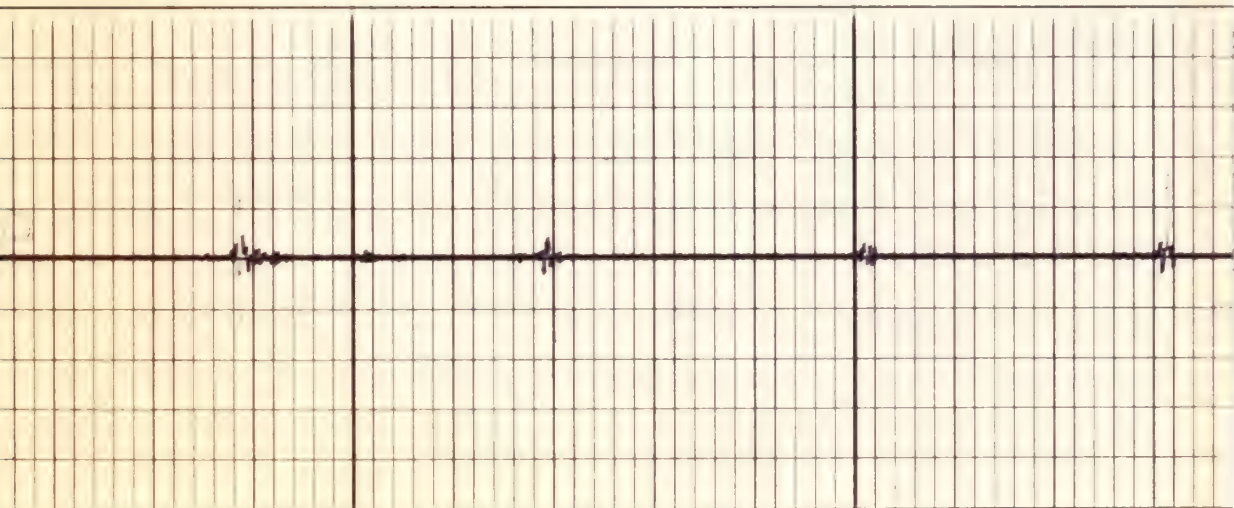
| | | | |
|--------------------------------------|--|--------|--|
| Casing Collar Log Before Perforation | | Depths | |
|--------------------------------------|--|--------|--|

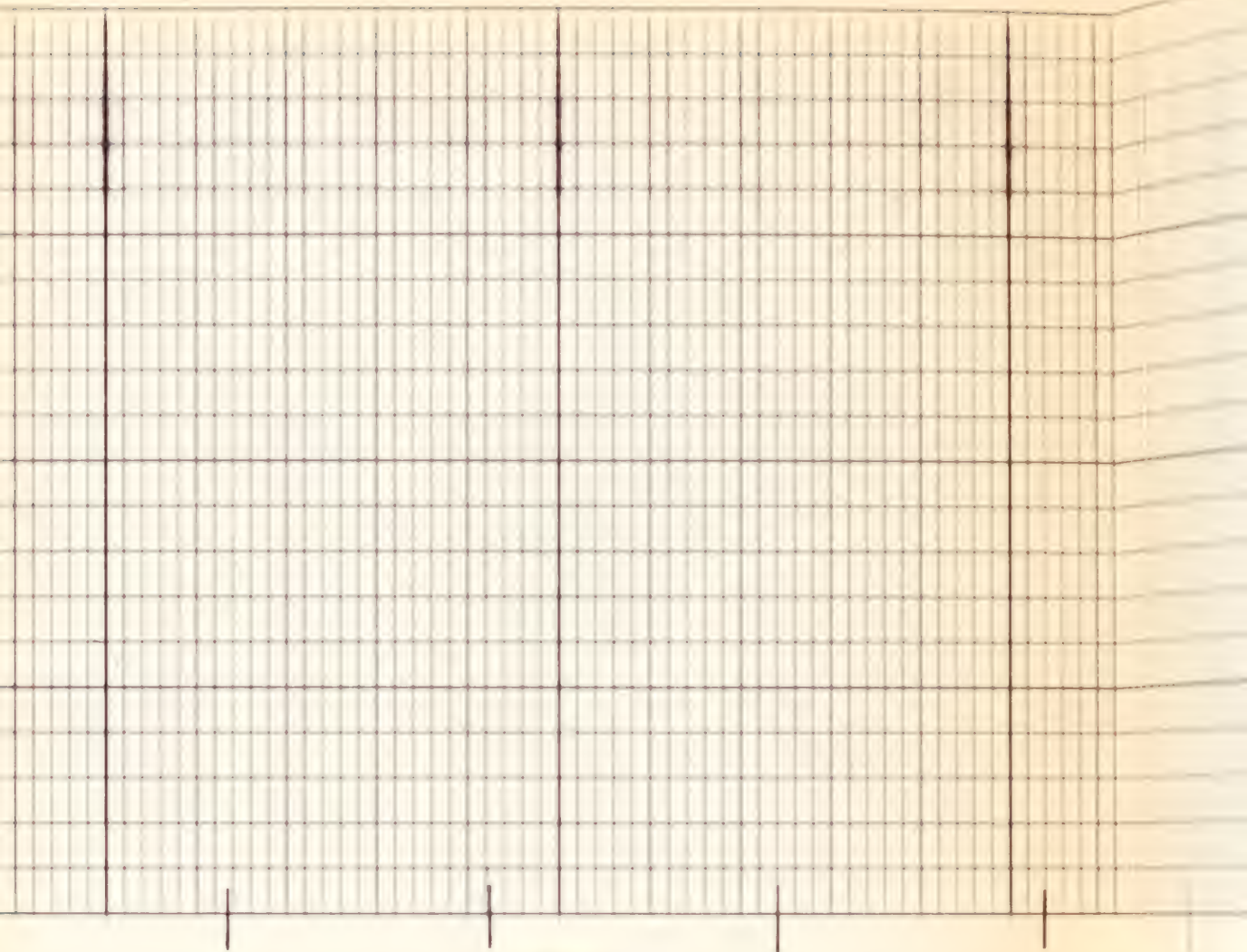
| | | | |
|---------------------|--|------|--|
| NO. 1 - LONG STRING | | 0700 | |
|---------------------|--|------|--|

Remarks: NO PERFORATING IN NO. 3 - SHORT STRING

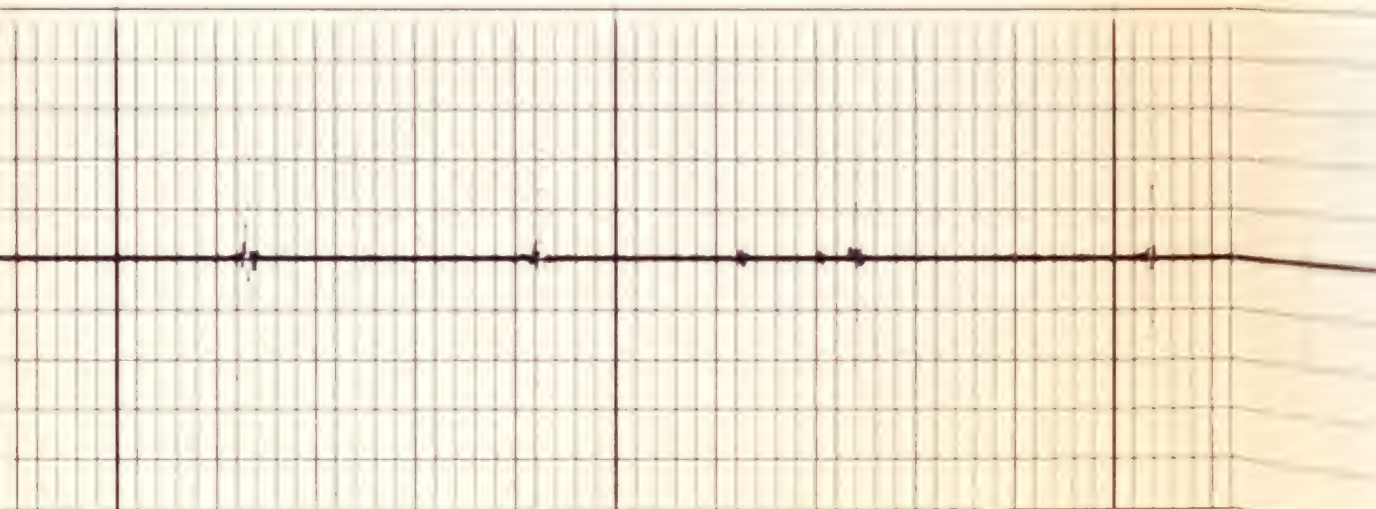


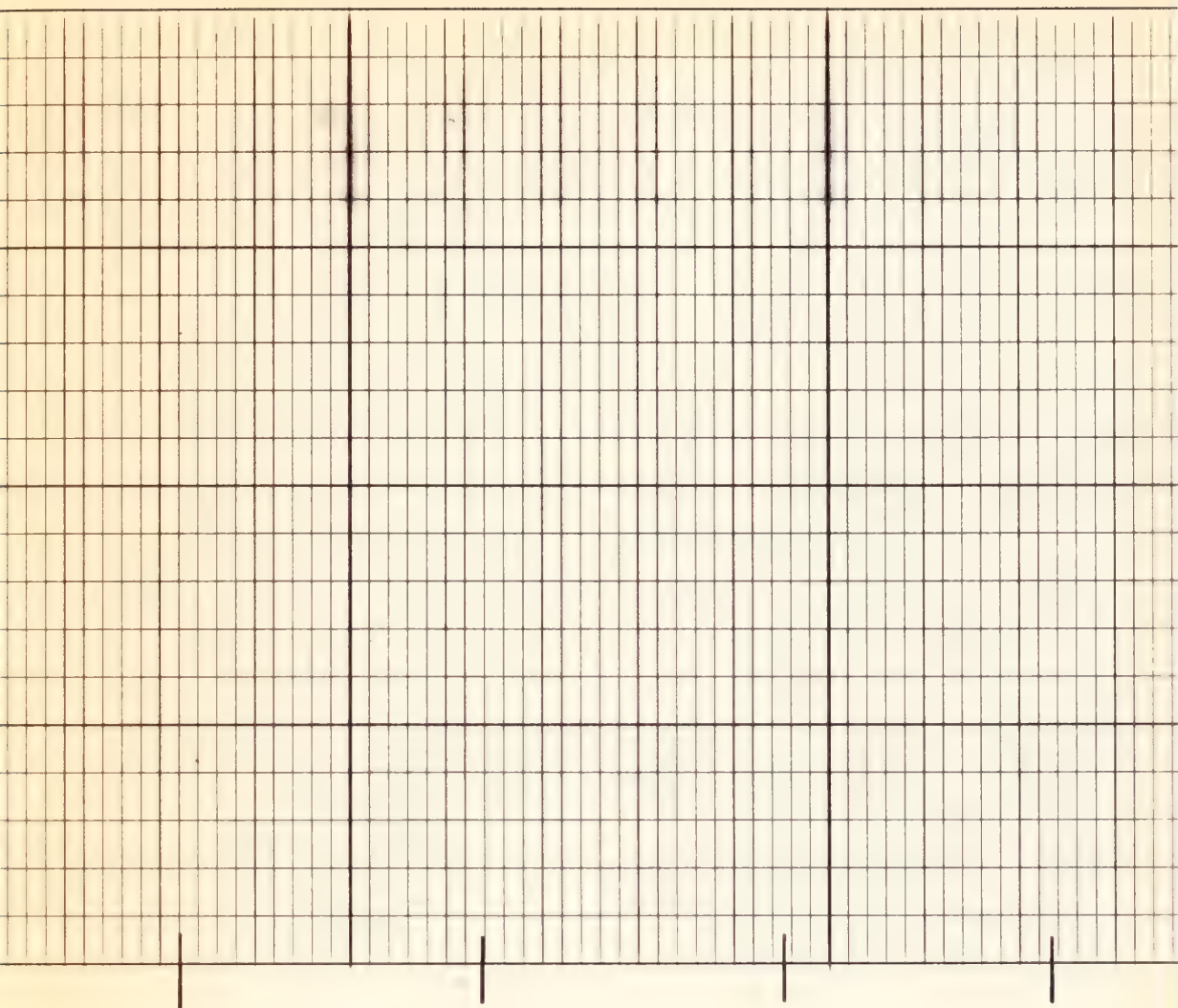
0800



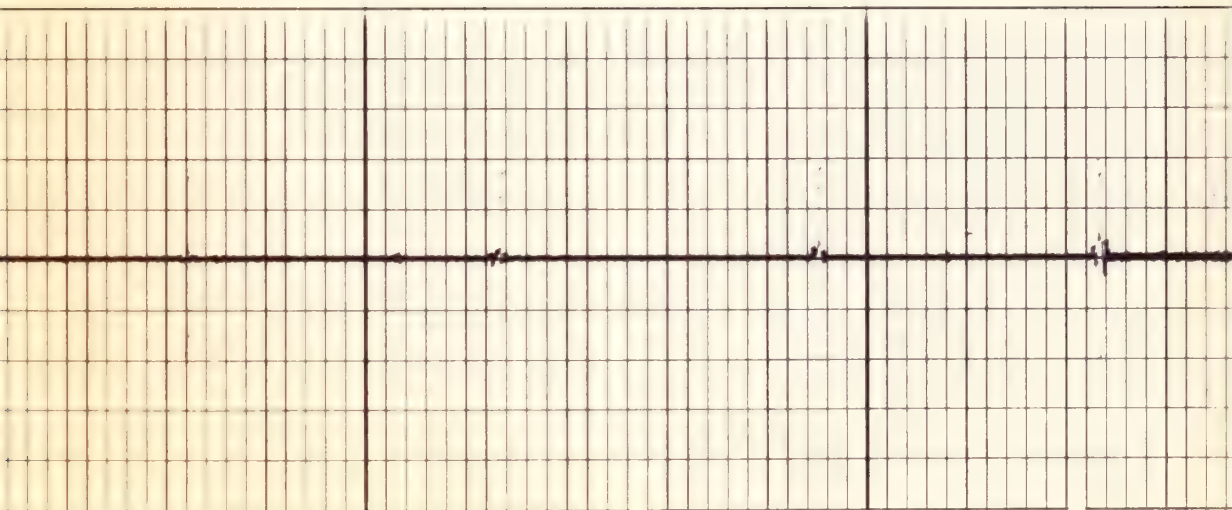


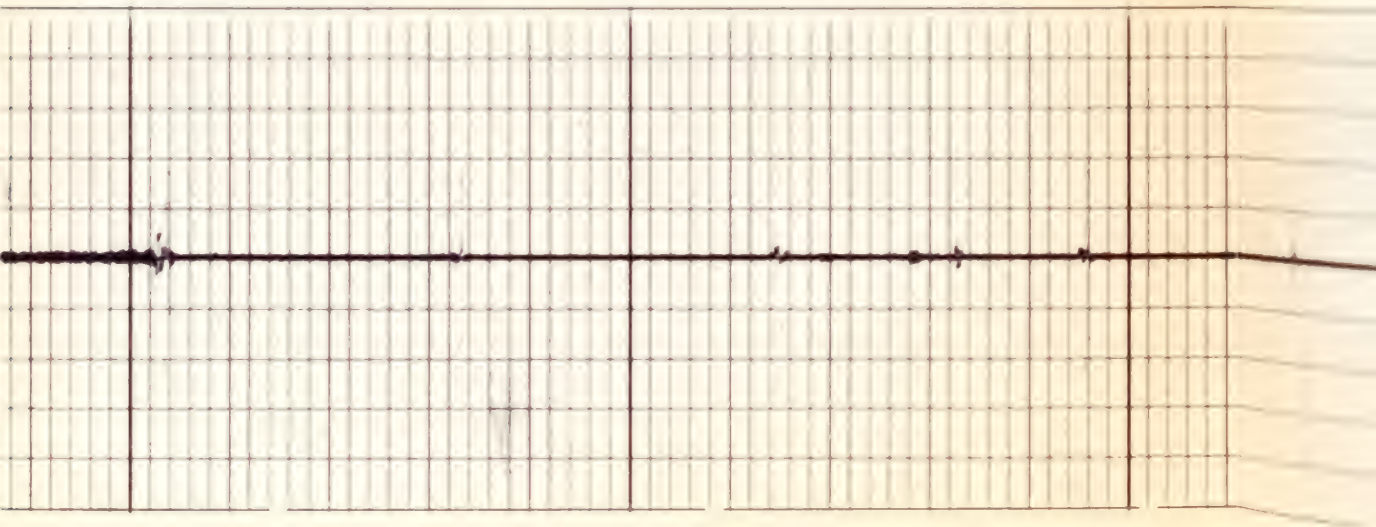
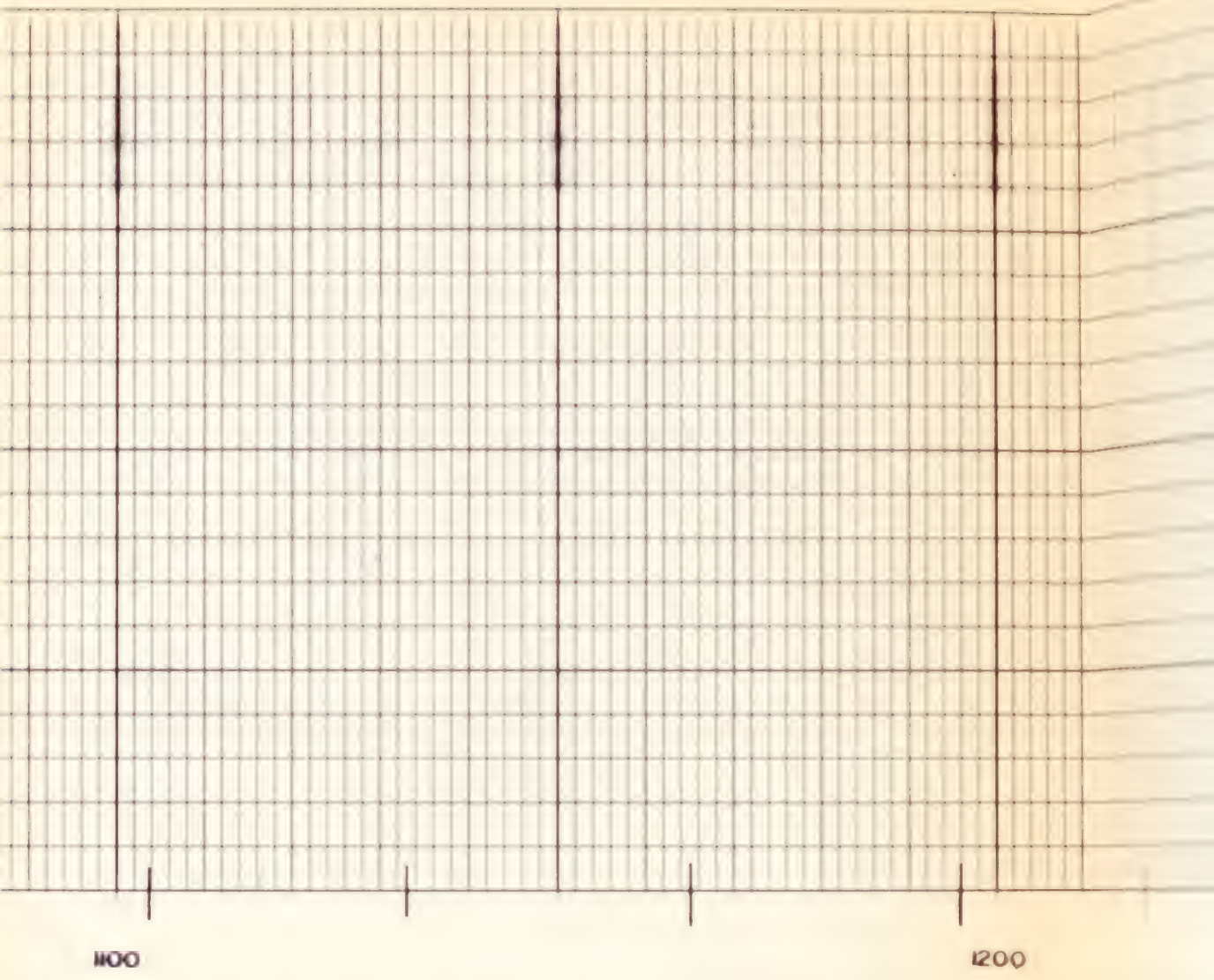
0900

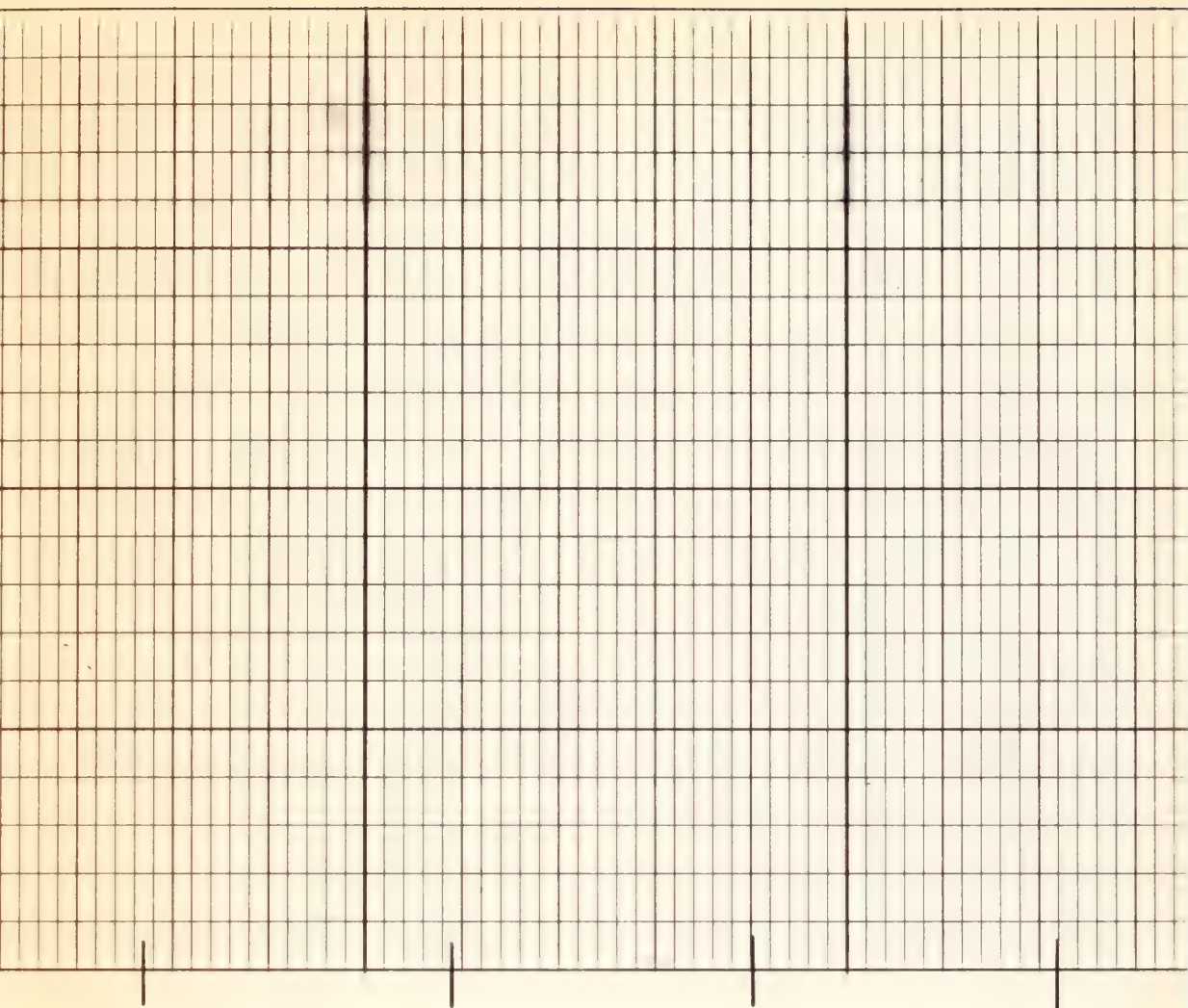




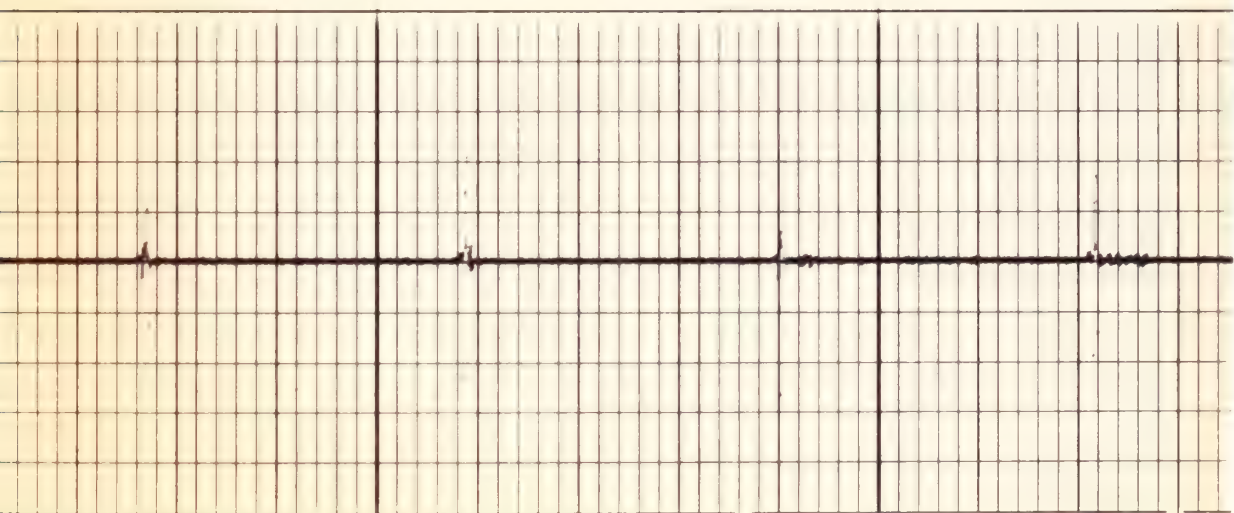
1000

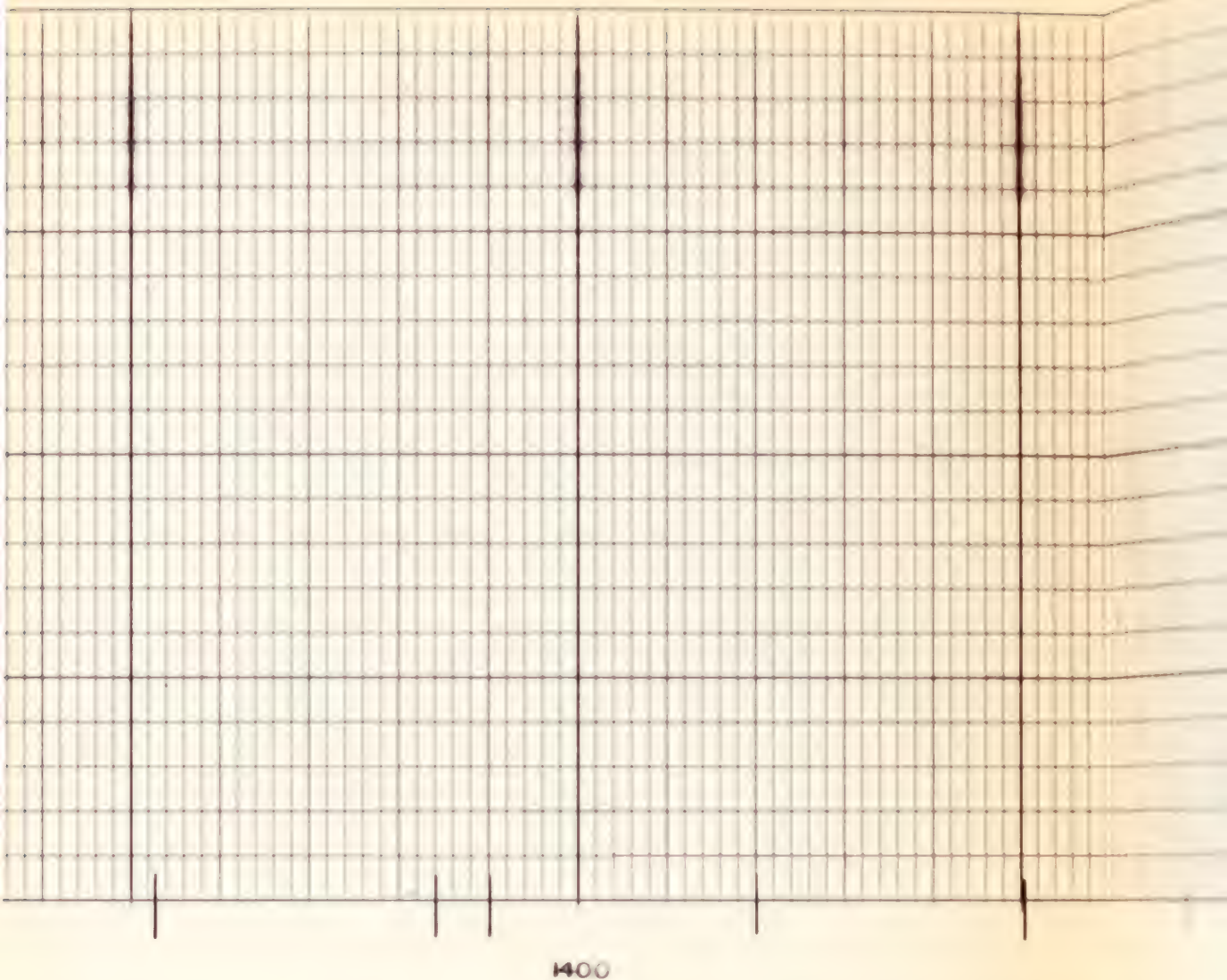




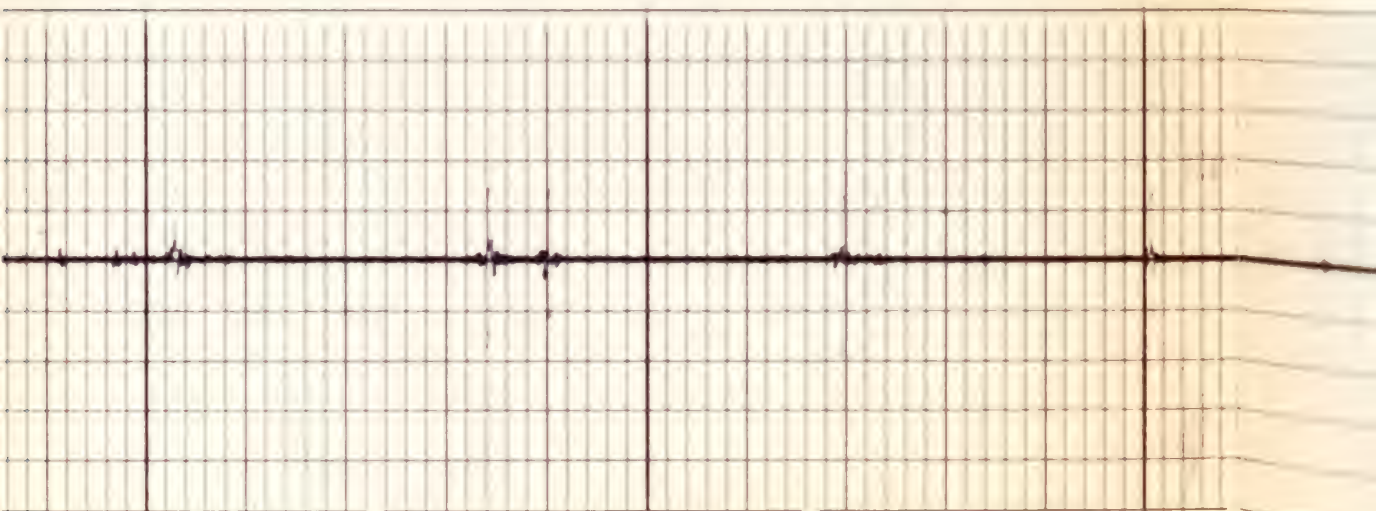


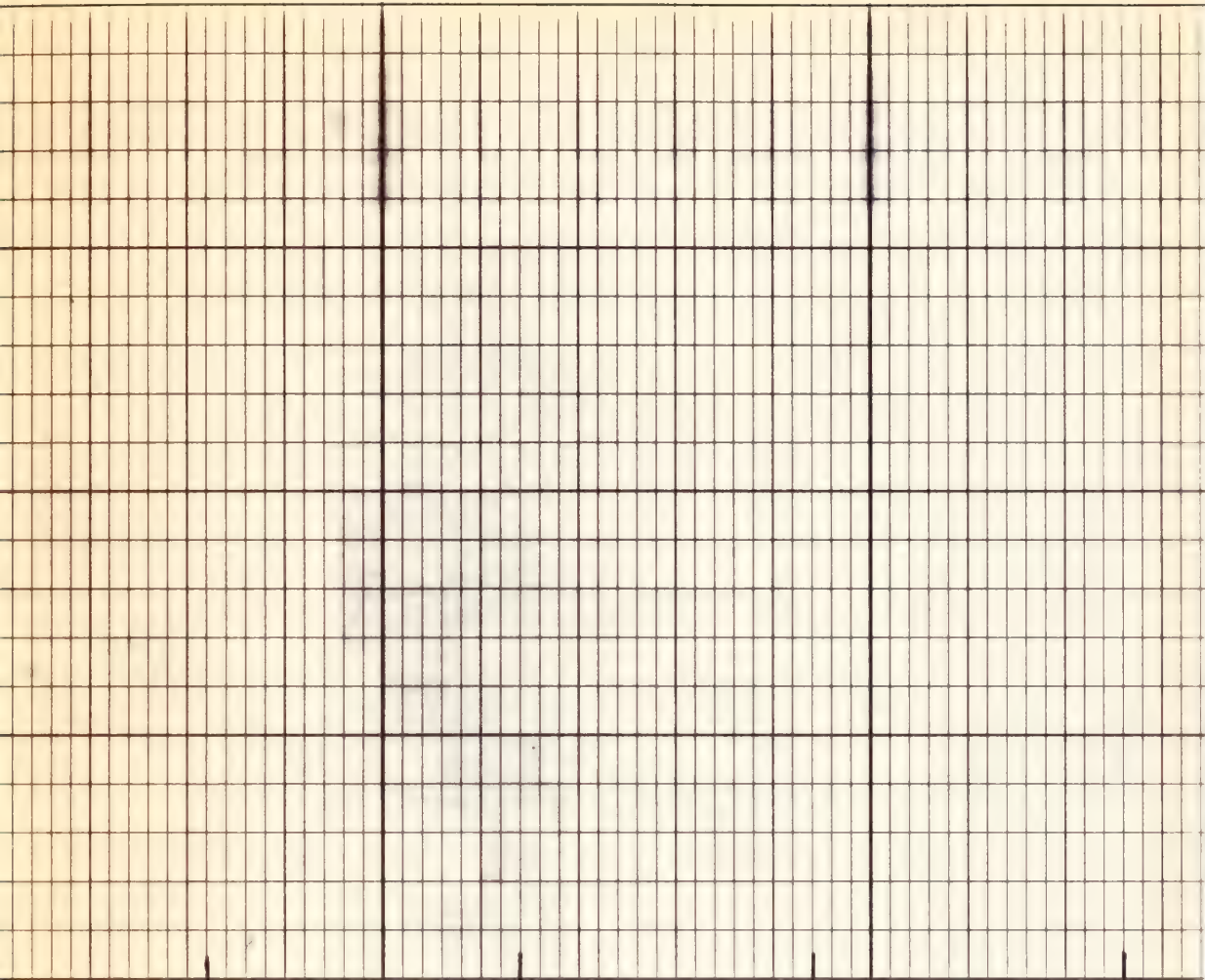
1300



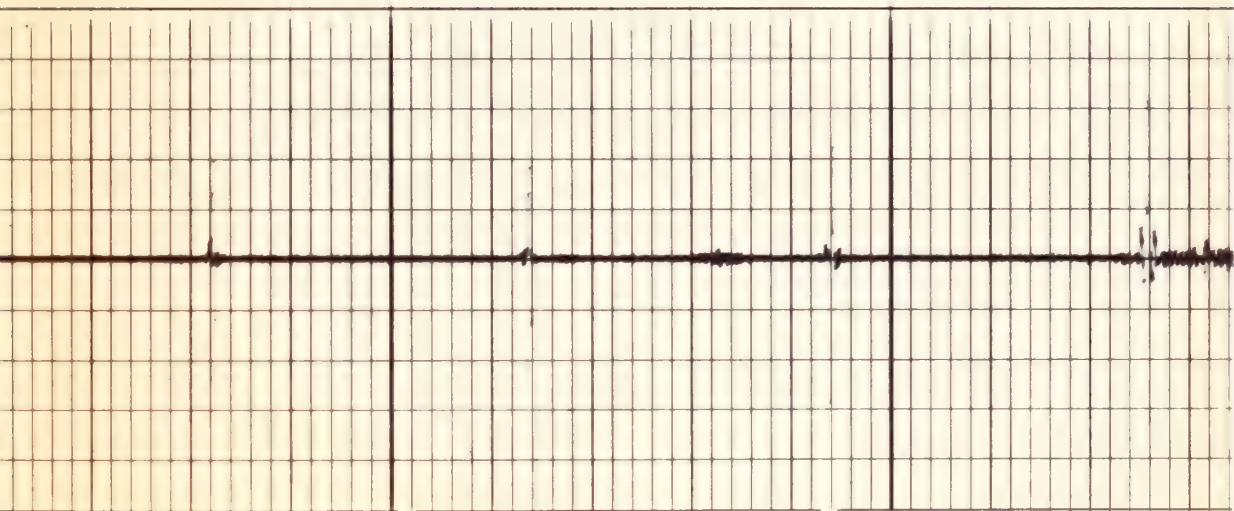


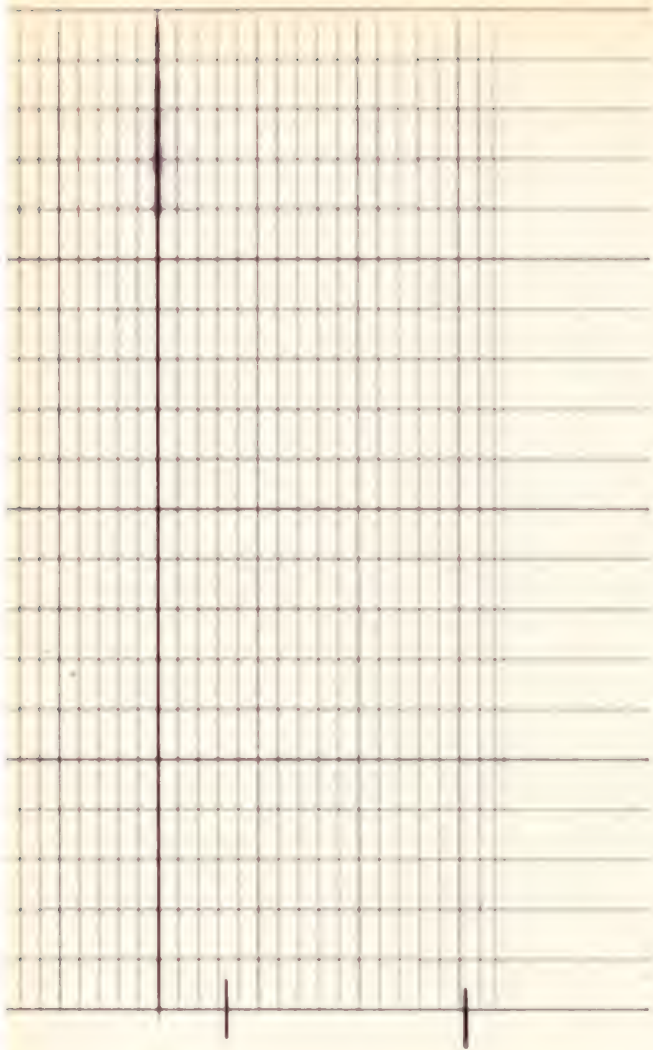
1400





1500





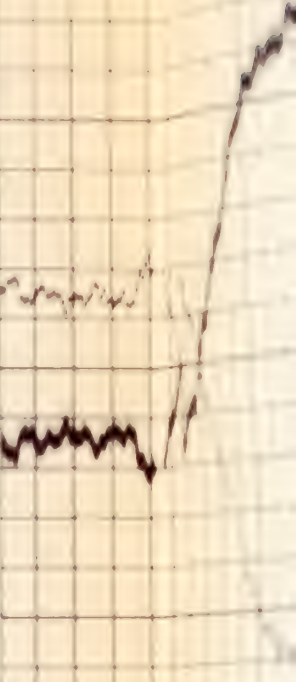
INDEXING RECORD

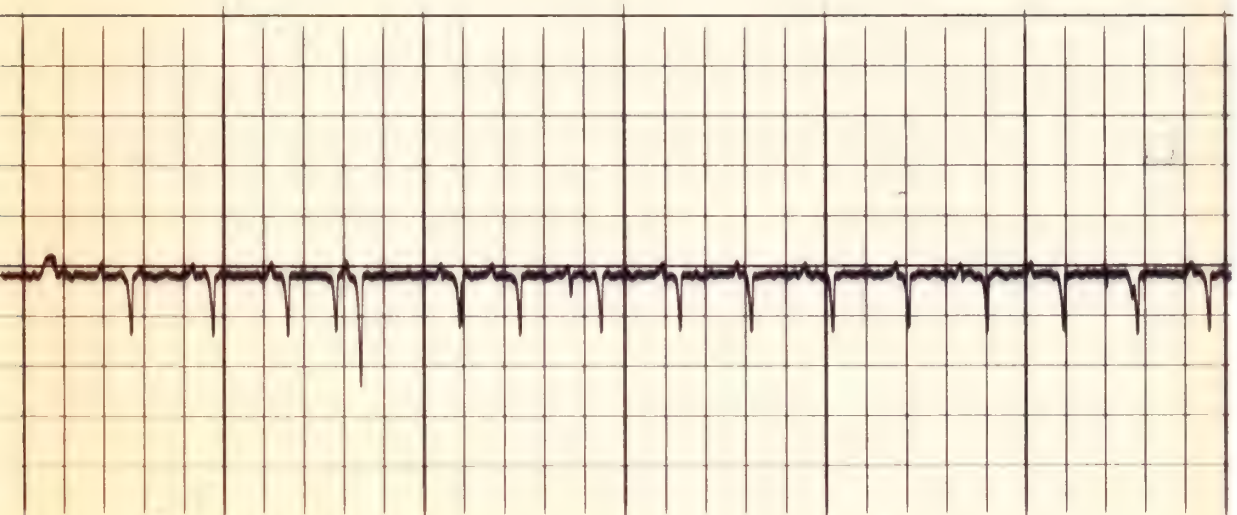
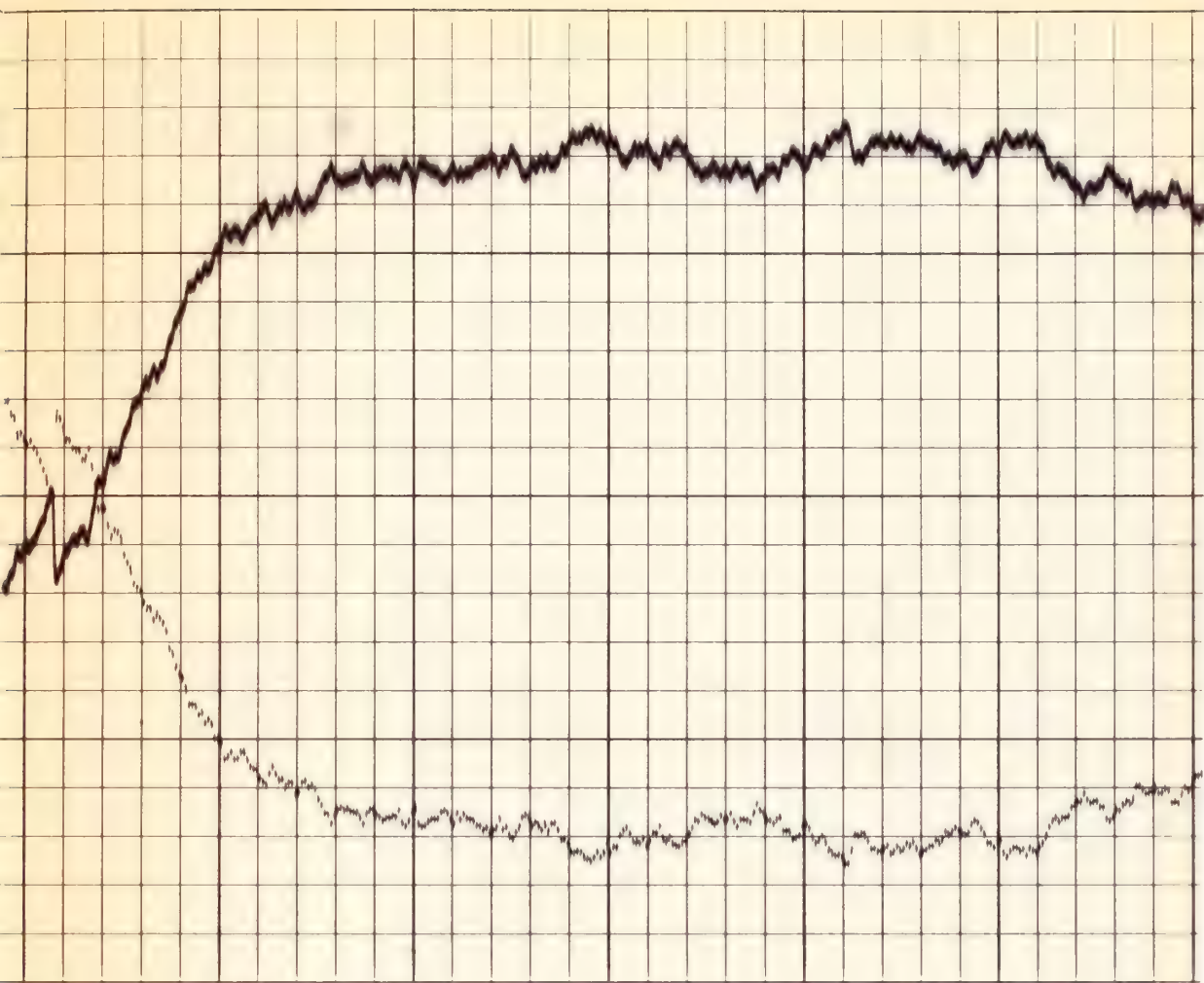
RADIATION RECORD

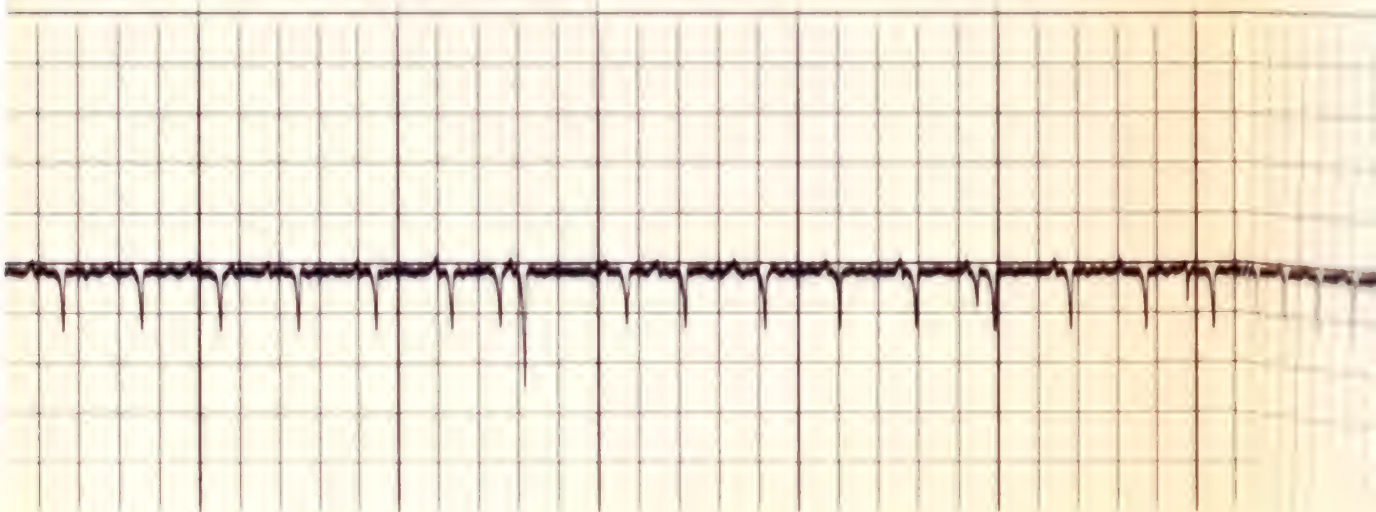
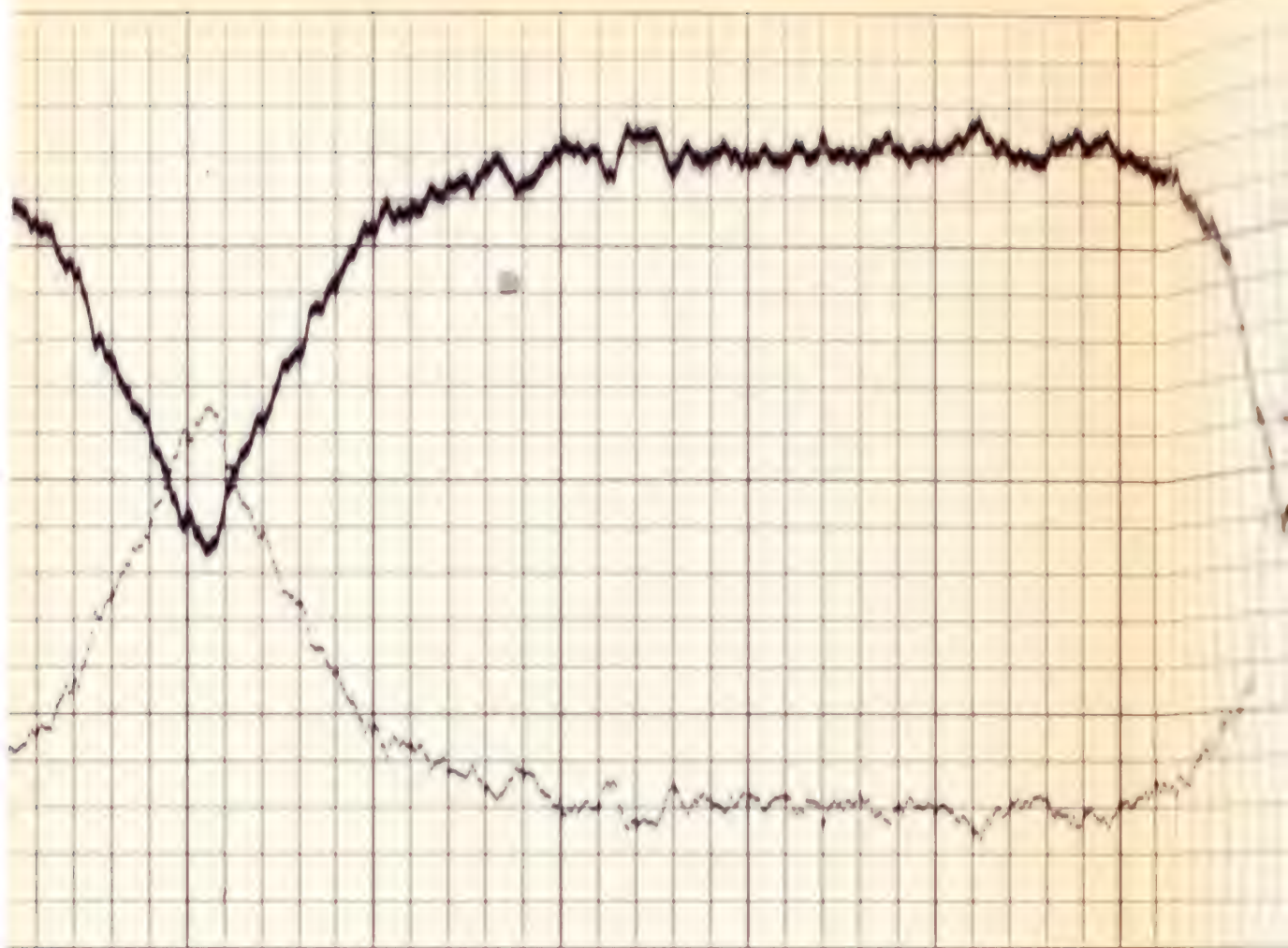
TYPICAL ORIENTING
RECORD IN LONG STRING
PERFORATED 1435-143

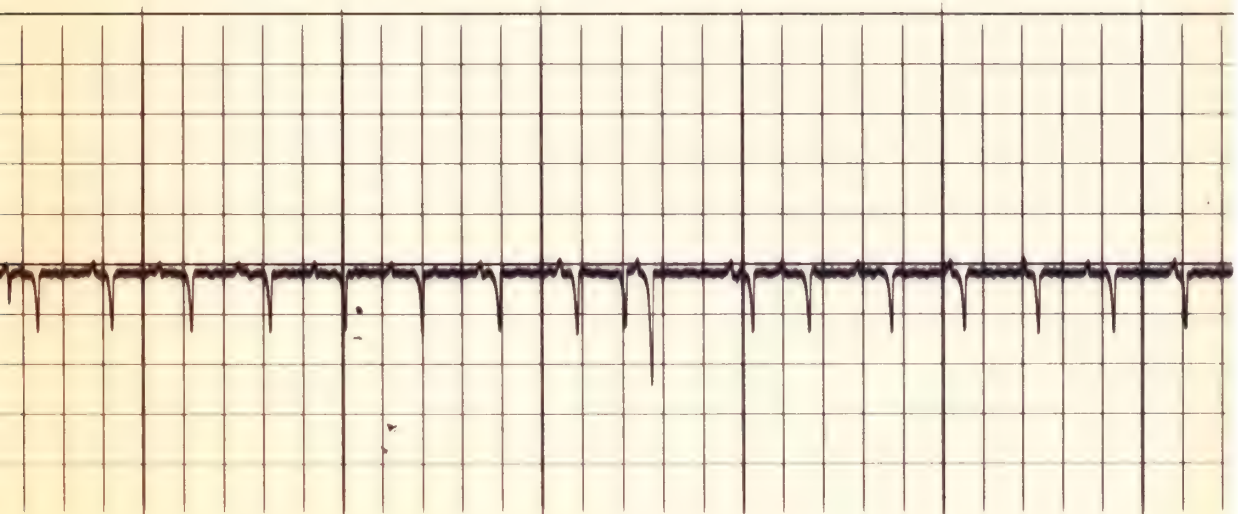
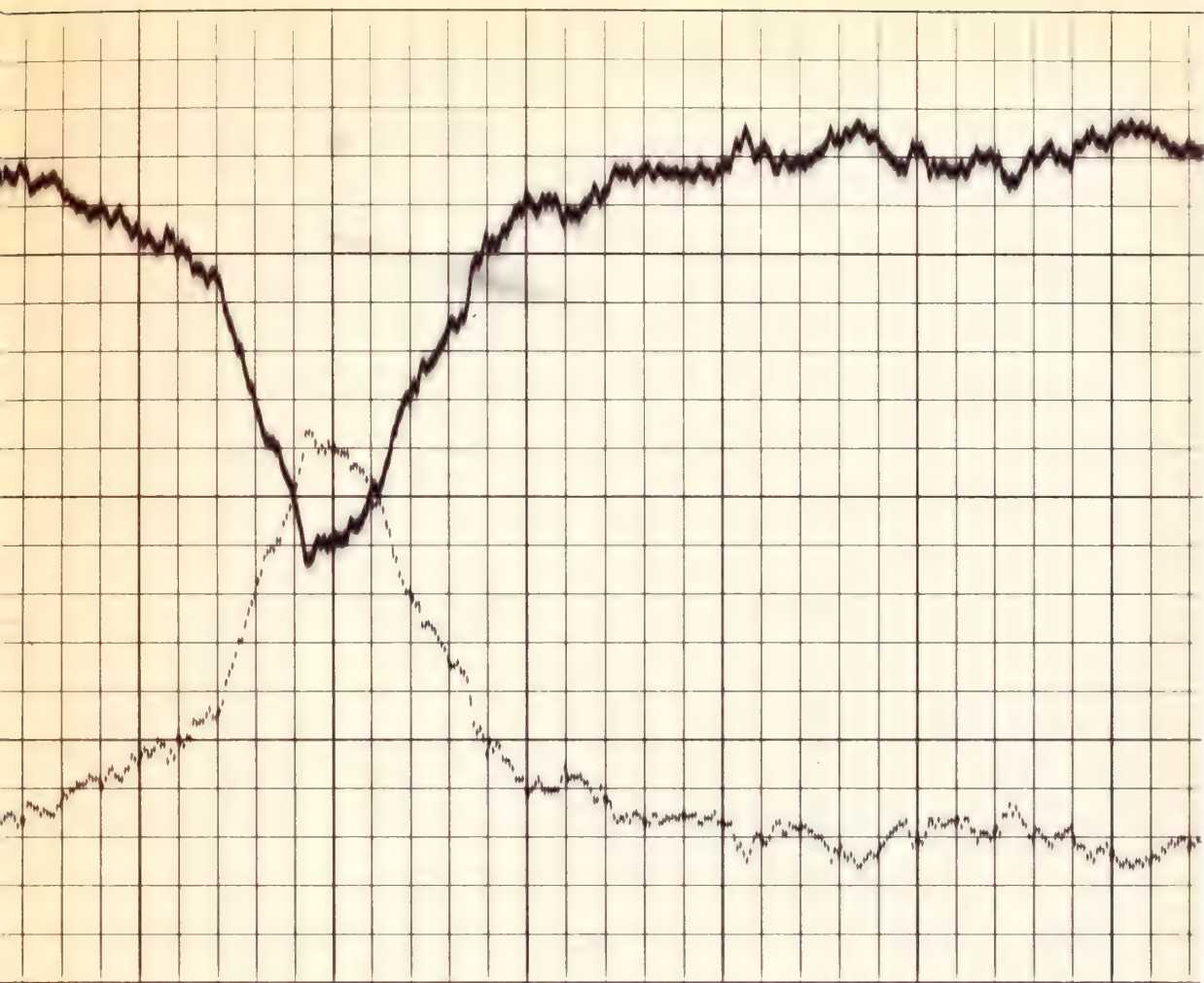
COUNTS INCREASE

COUNTS INCREASE





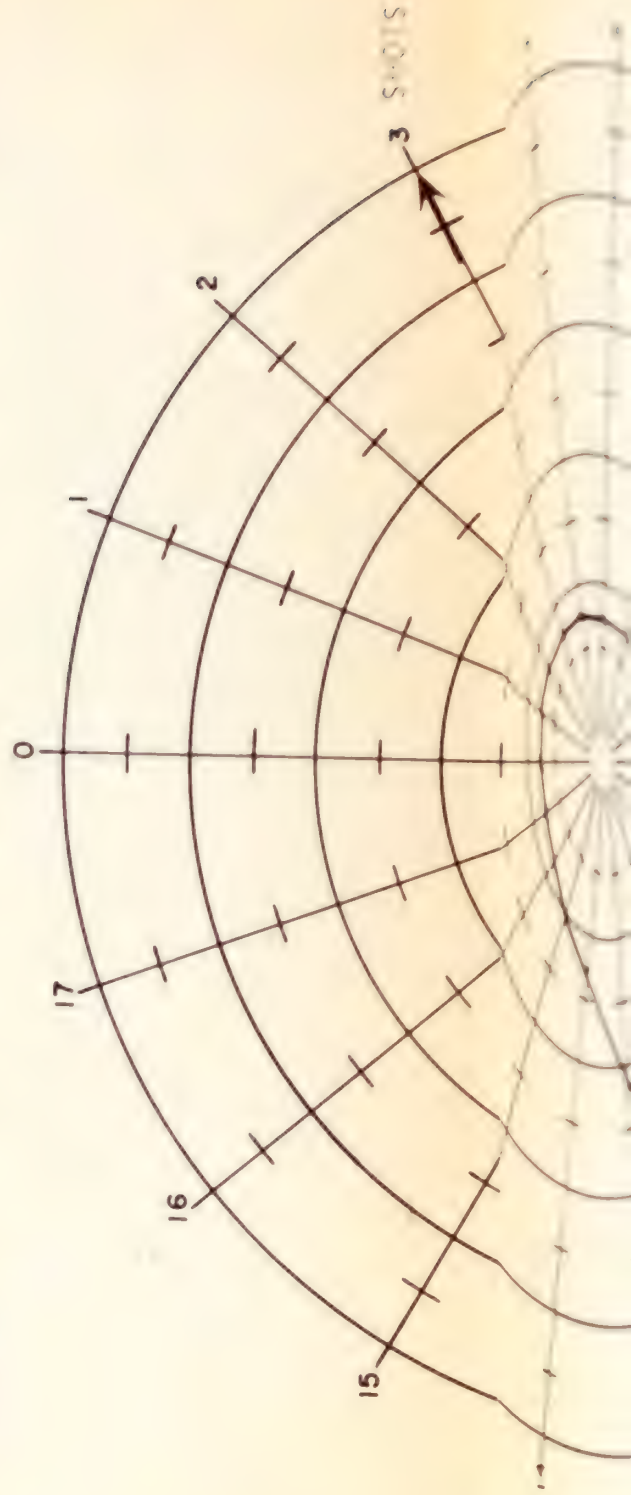


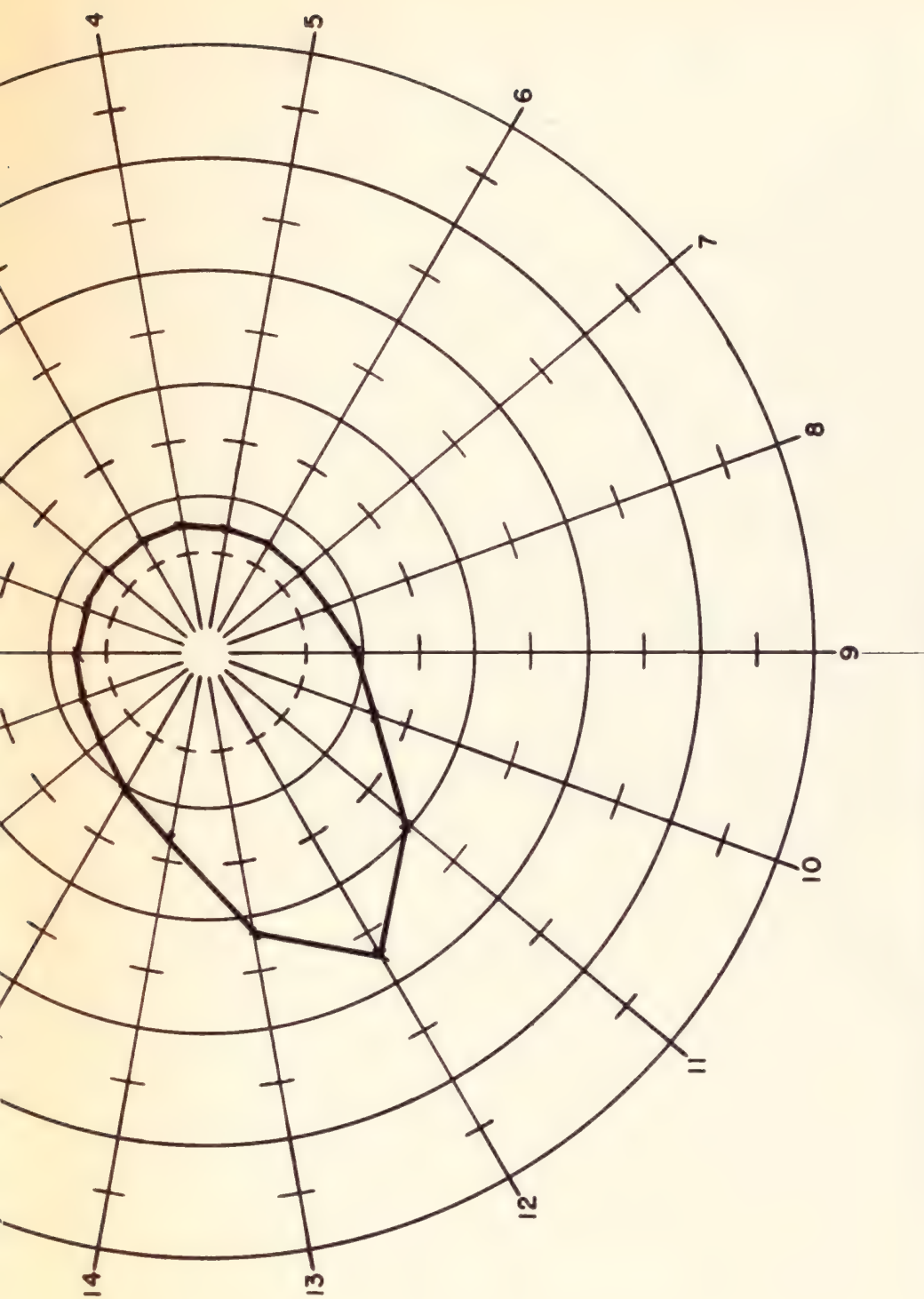


RADIOORIENTATION PLOT

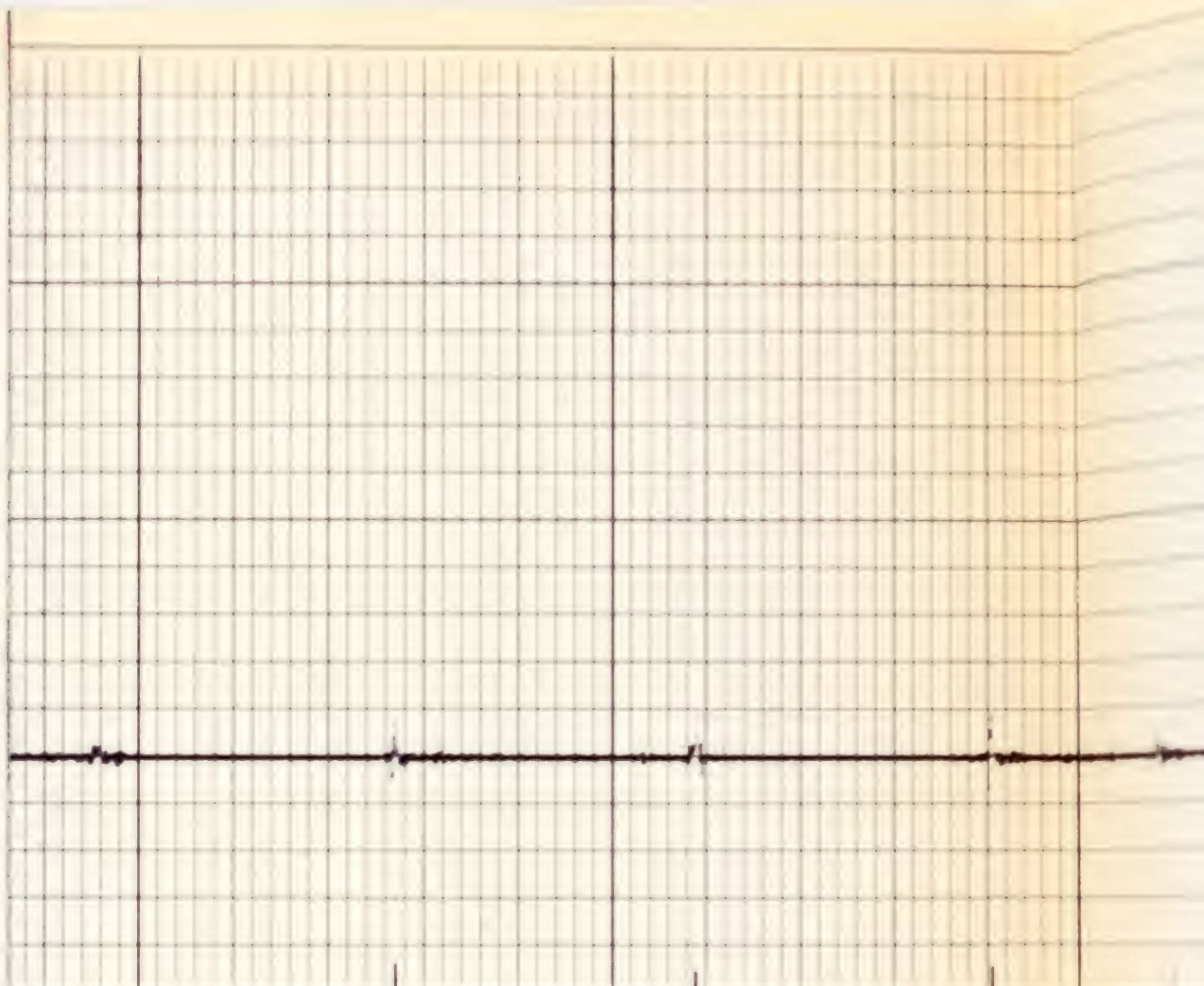
POT-B

NO. 1-LONG STRING PERFORATED 1435-1445 ONE SHOT PER FOOT WITH 1 11/16" HIPERDOME
PLOT MADE FROM ORIENTING RECORD ABOVE



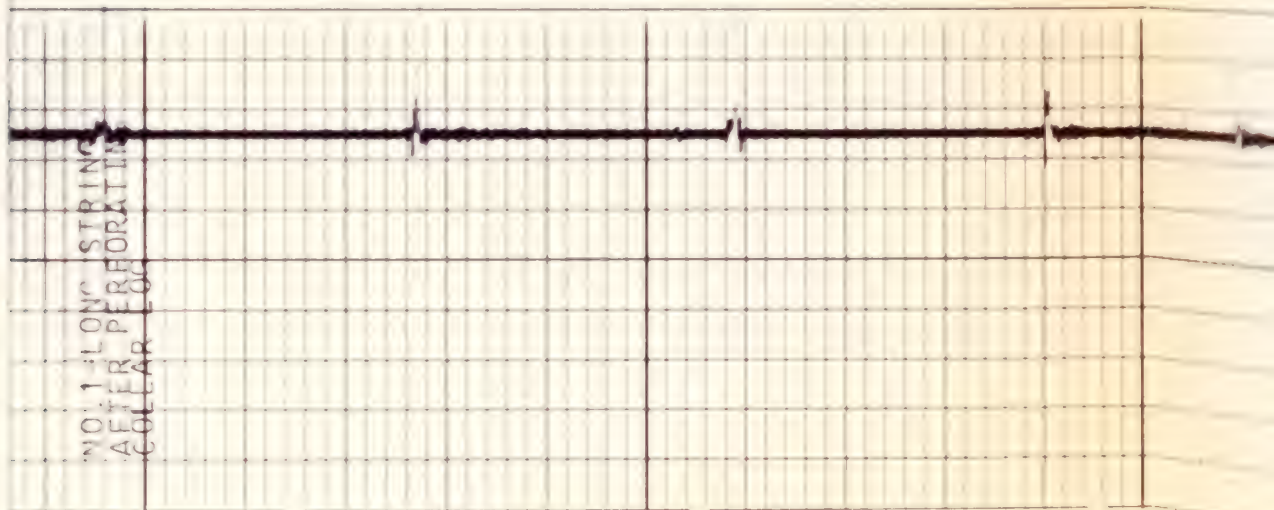


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

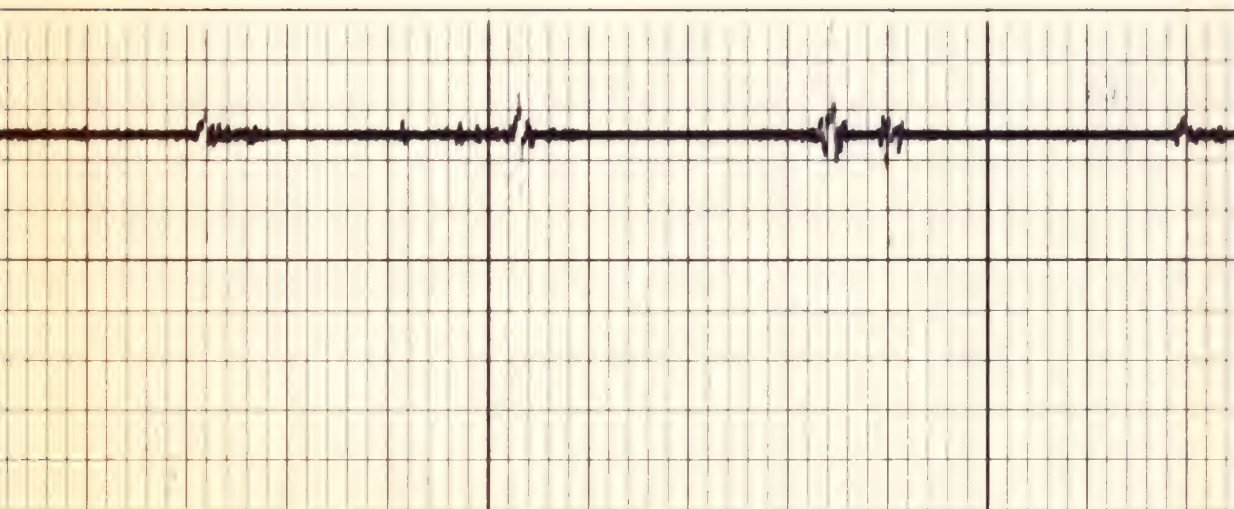
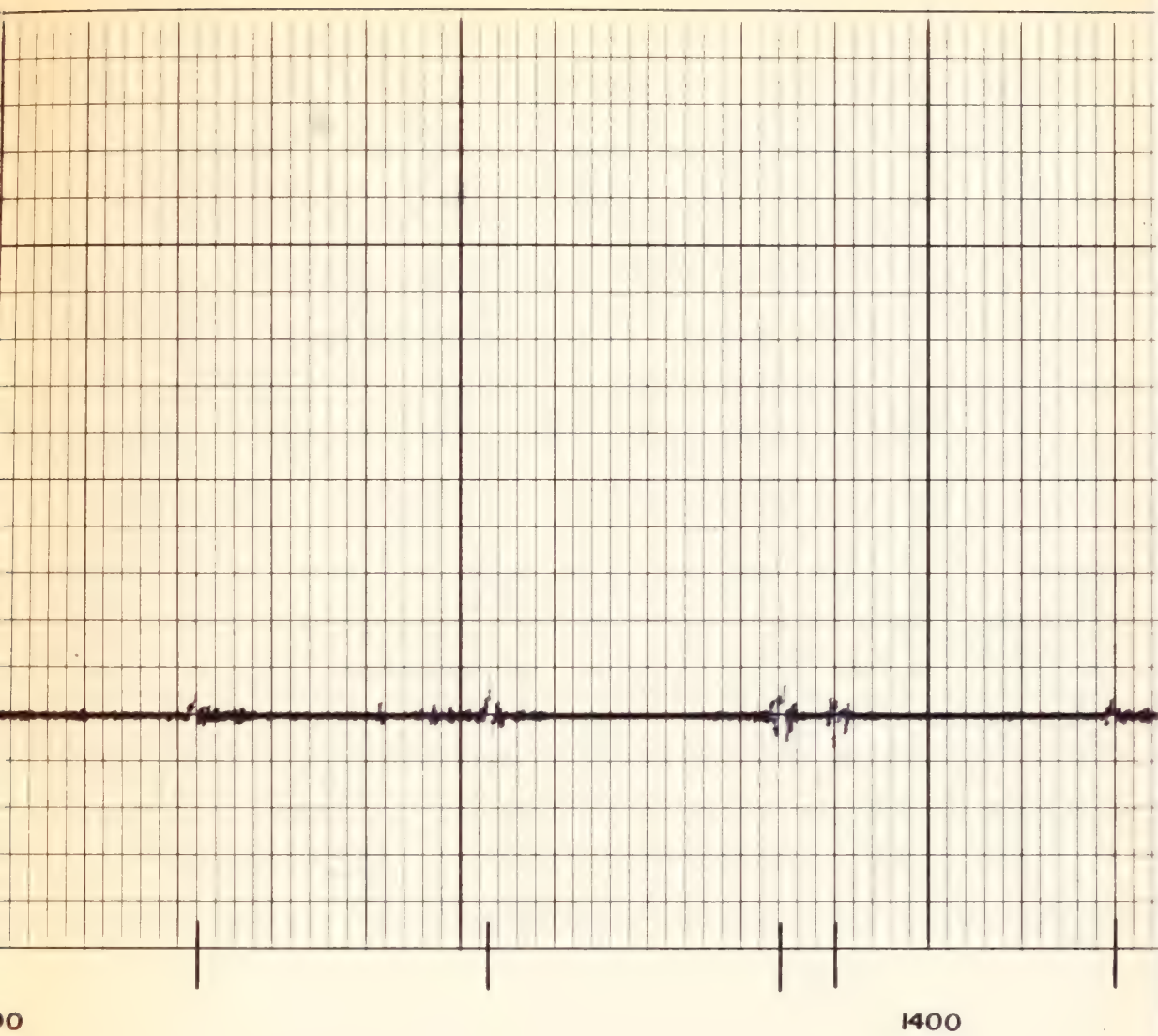


1200

1300

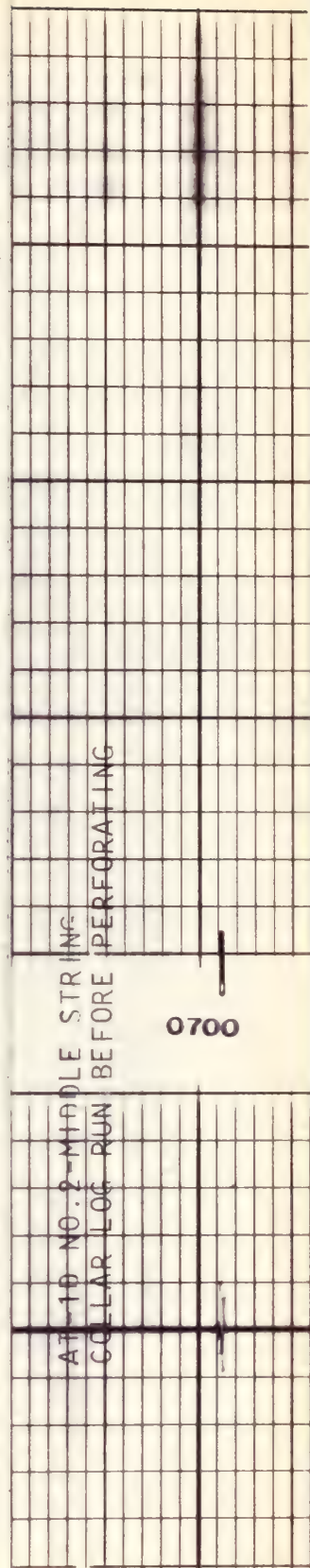
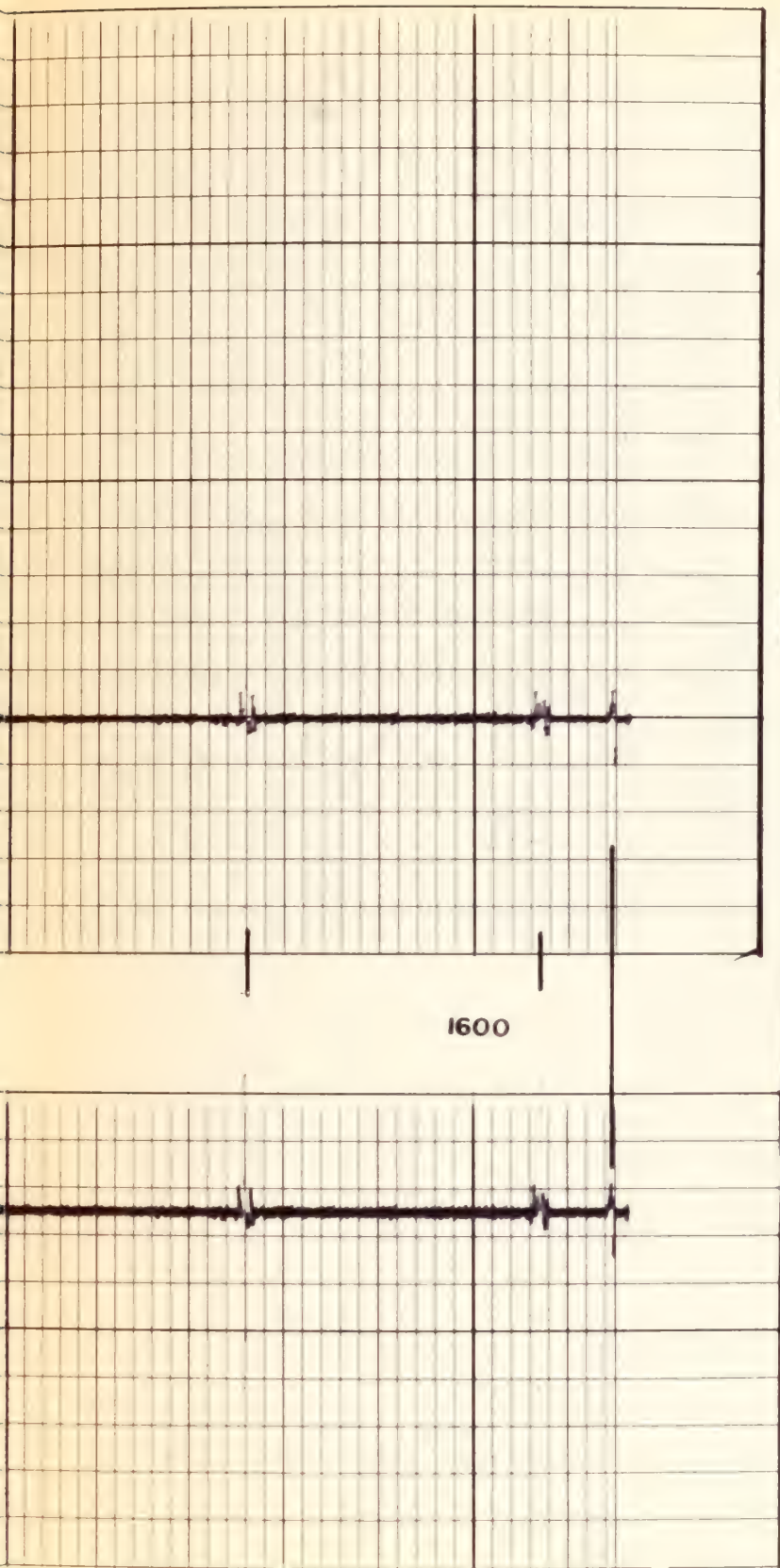


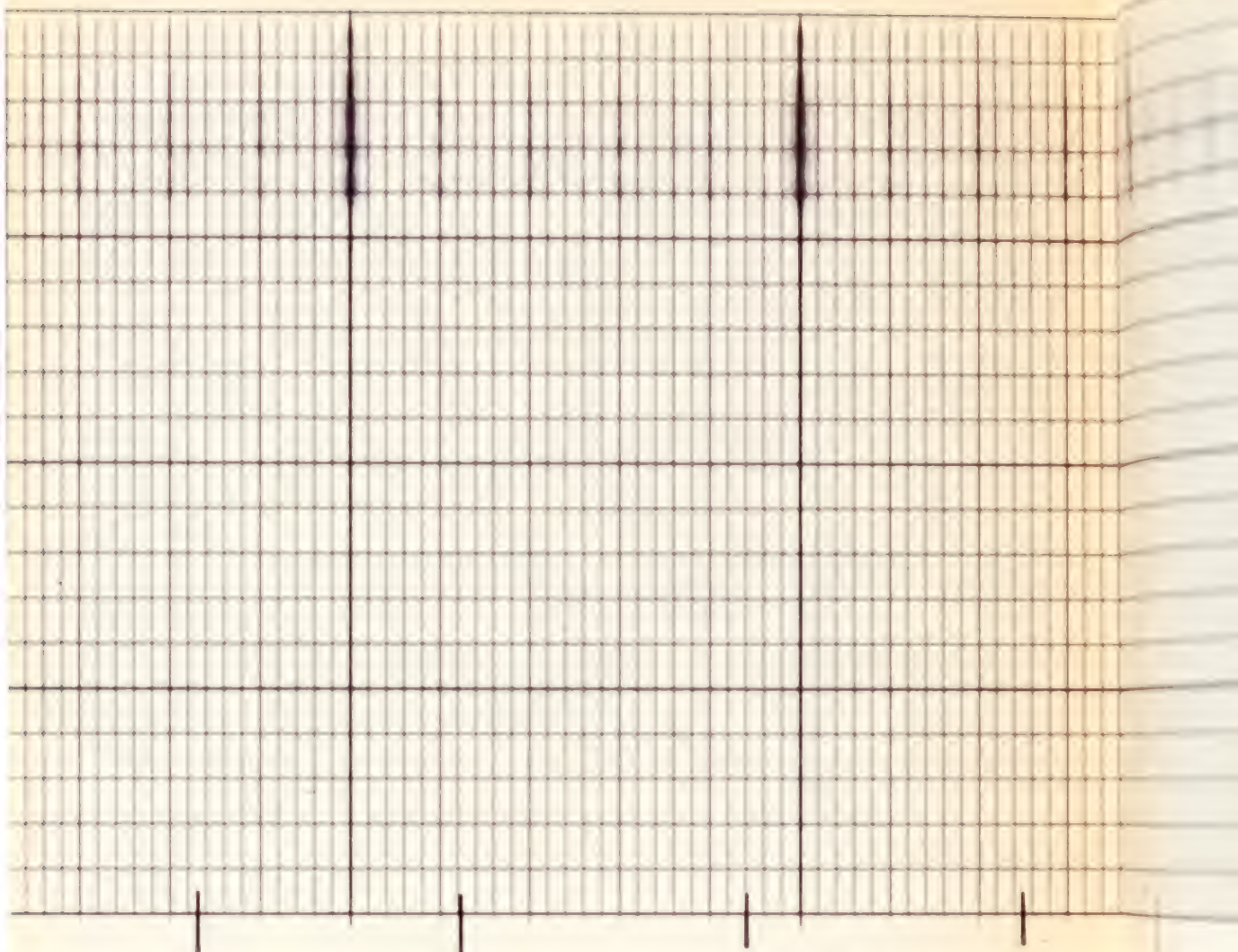
NO. 1 LONG STRIP
AFTER PERFORATION
COLLAR LOG



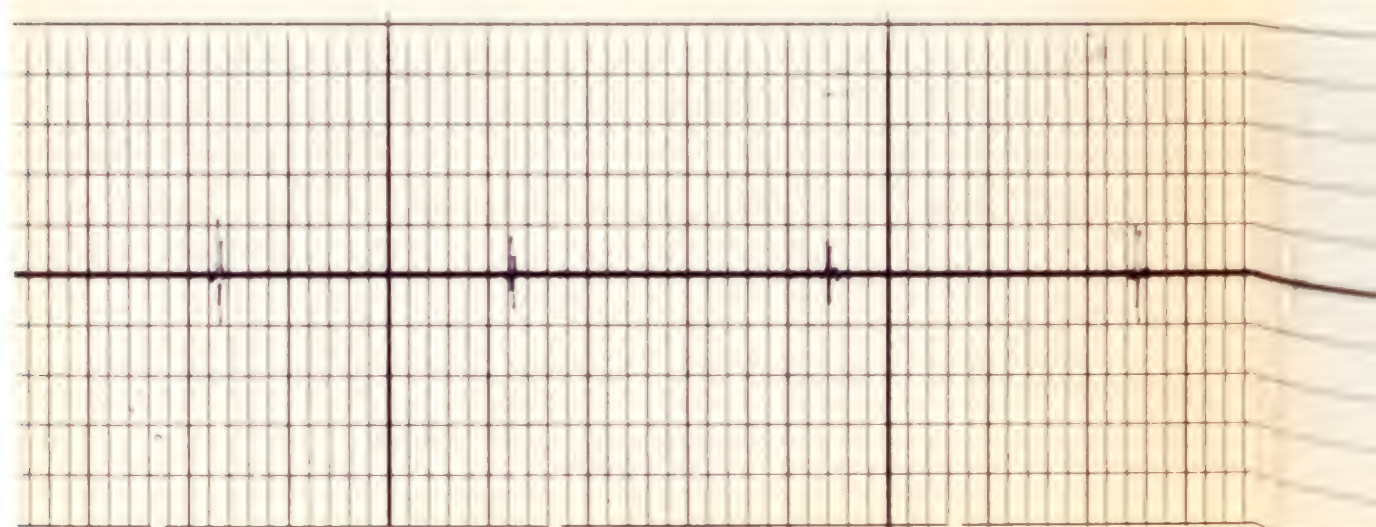
INDICATED INTERVAL
PERFORATED ONE SHOT
PER FOG WITH
1 11/15 HYPEROXIDE

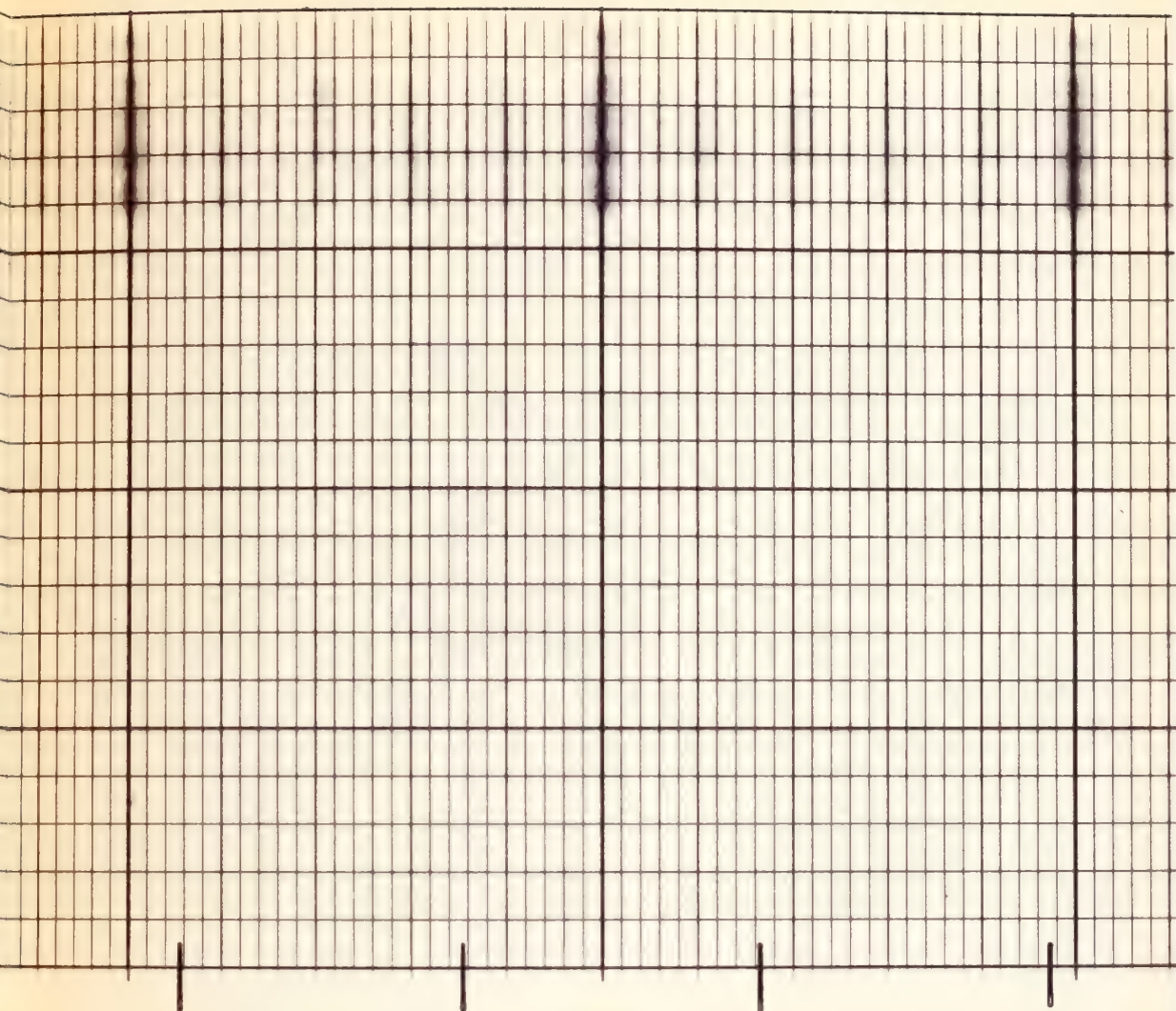
1500



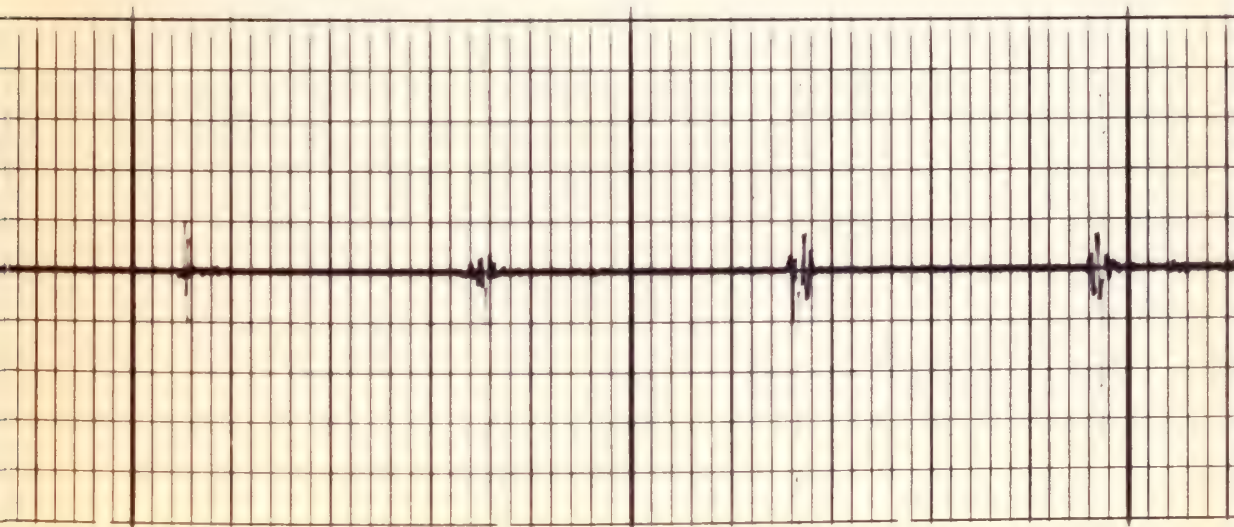


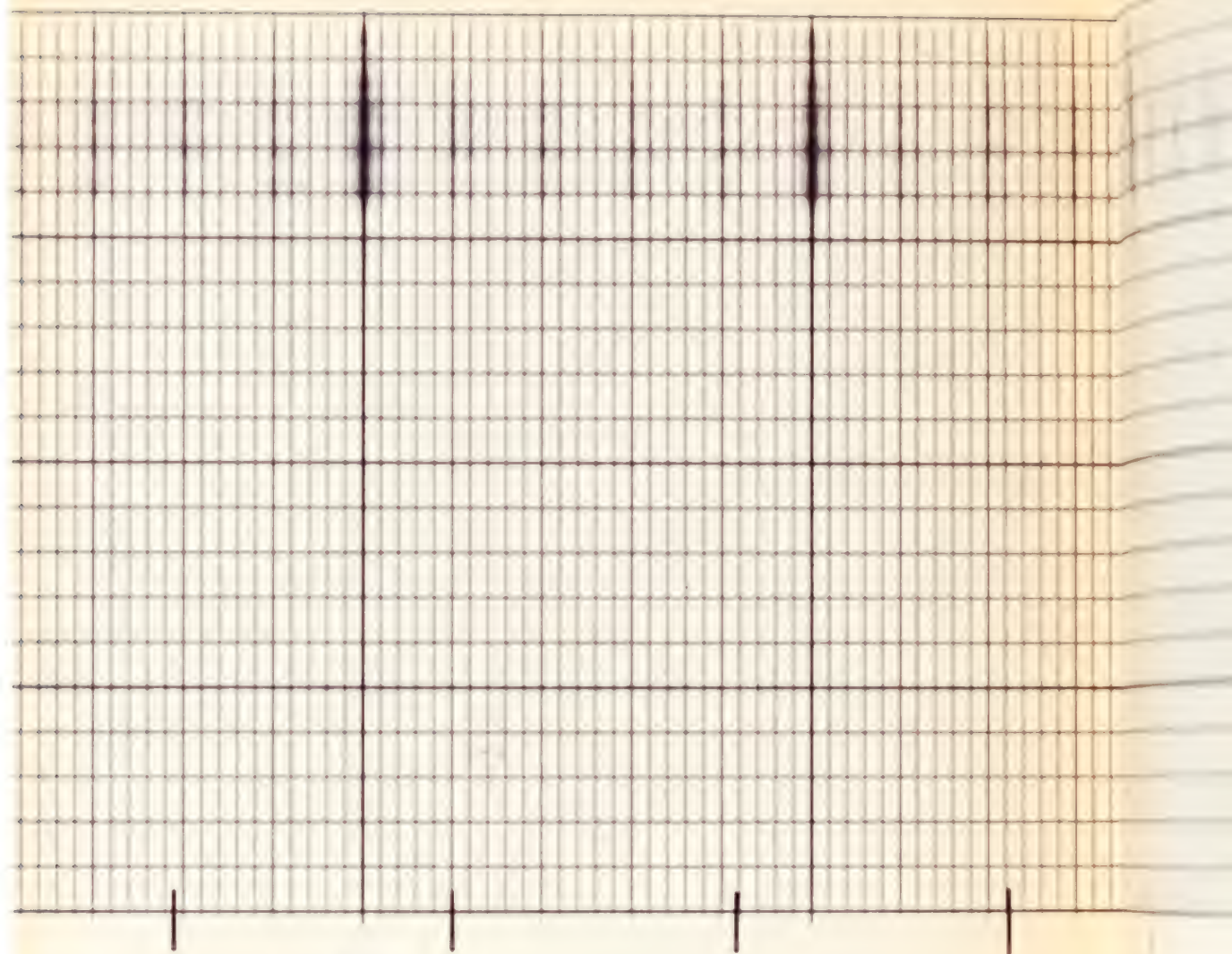
0800



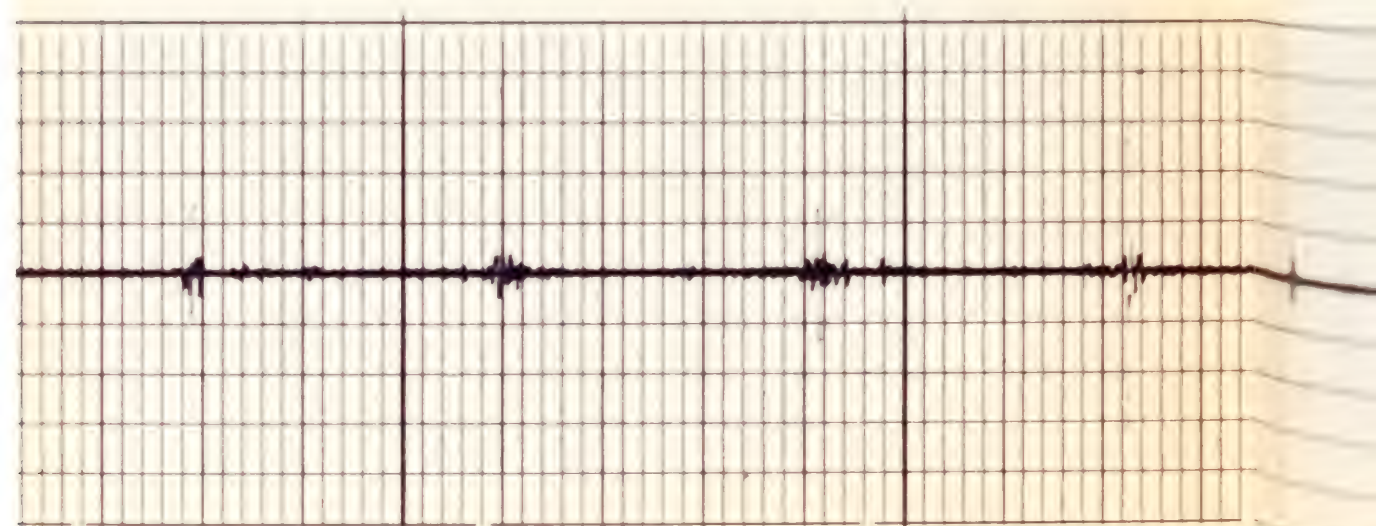


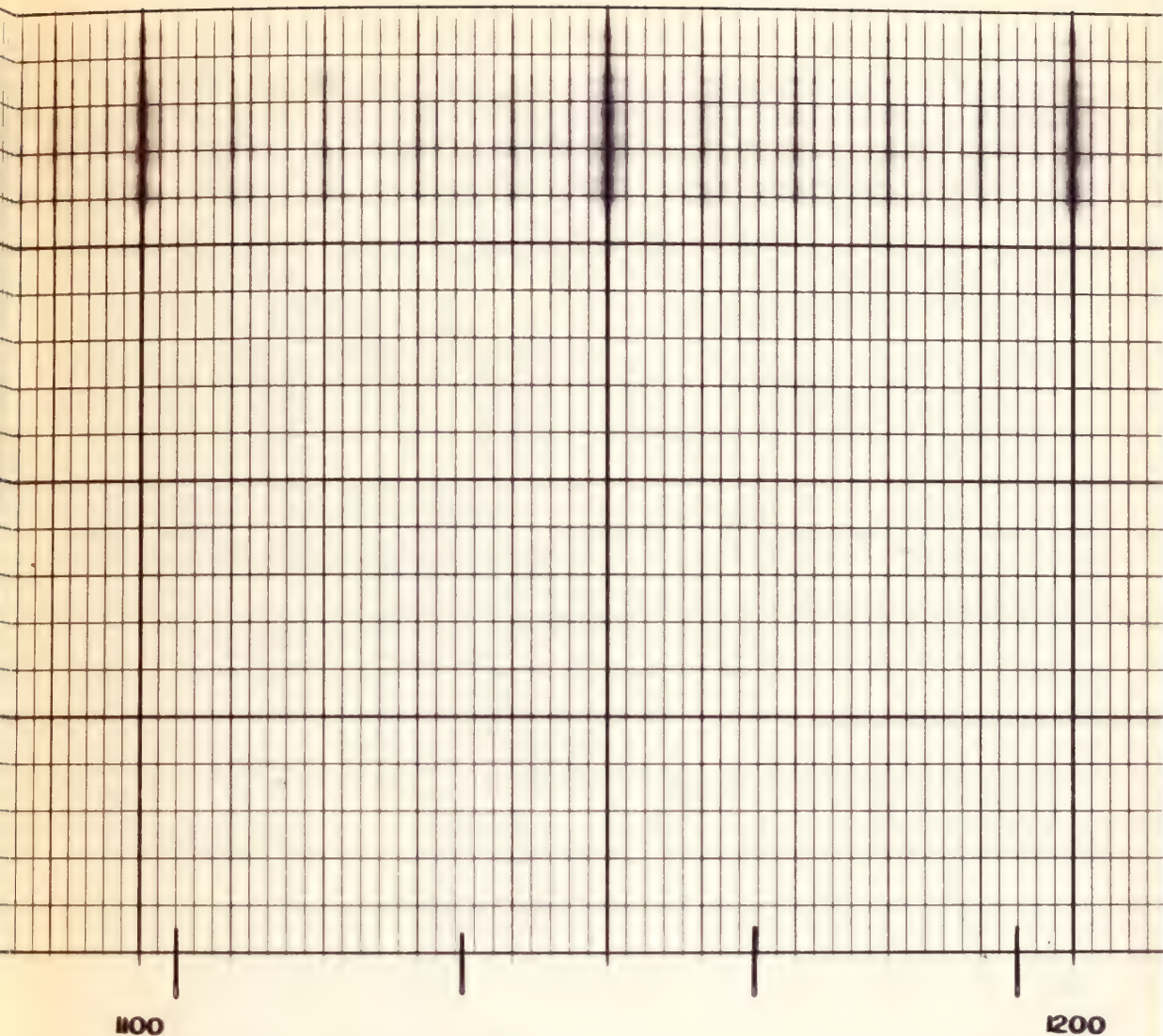
0900





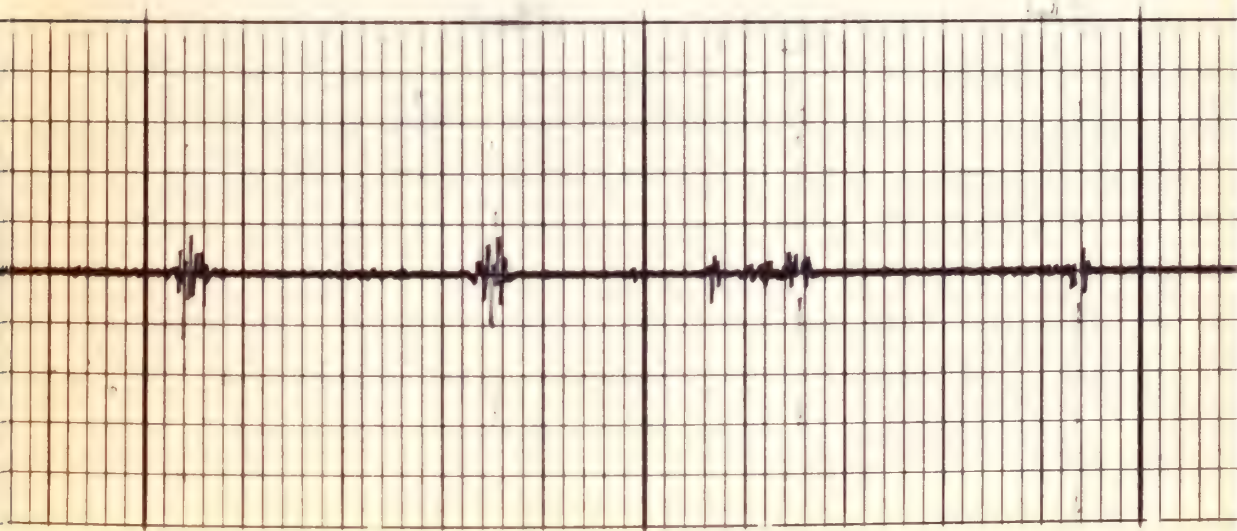
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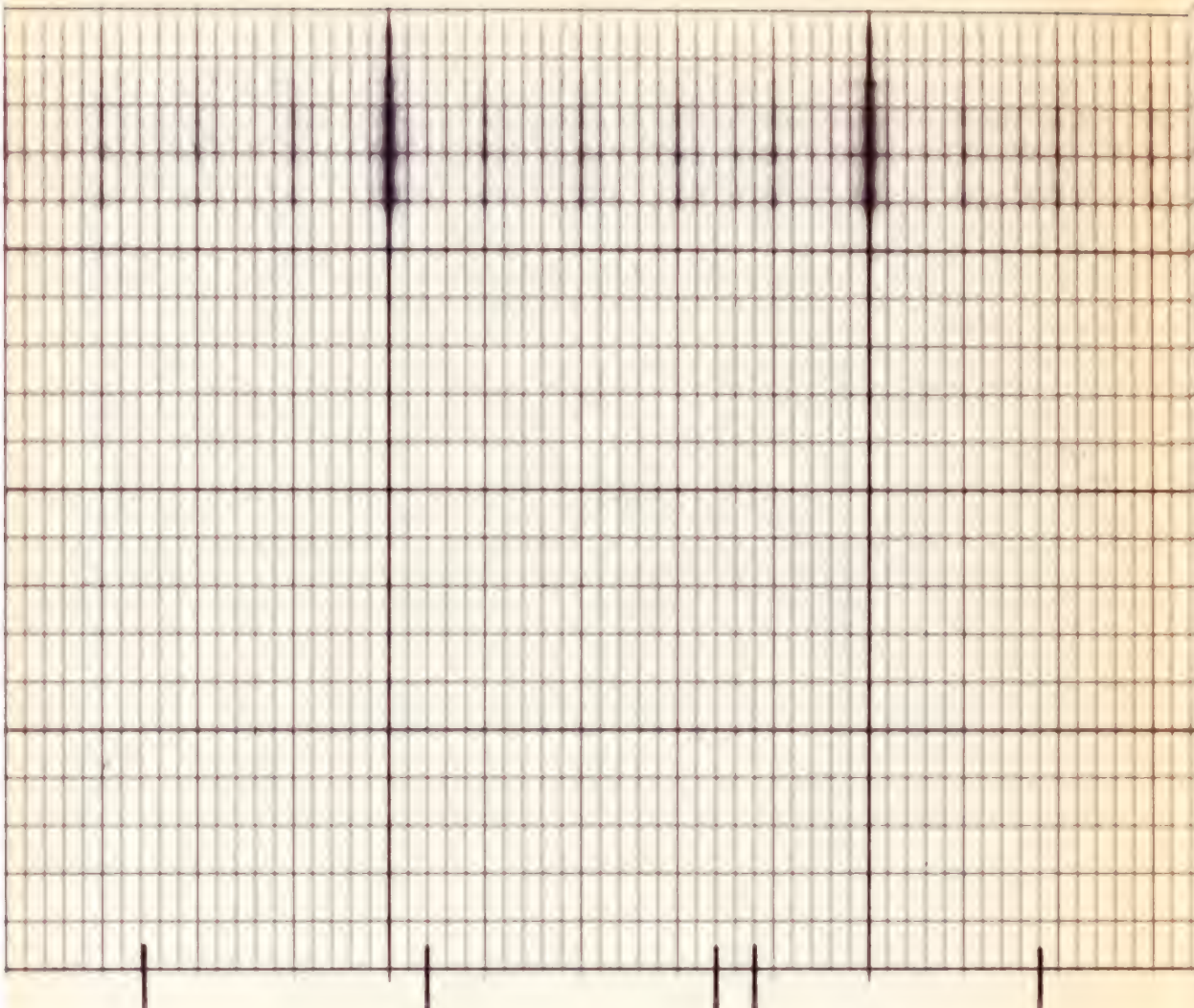




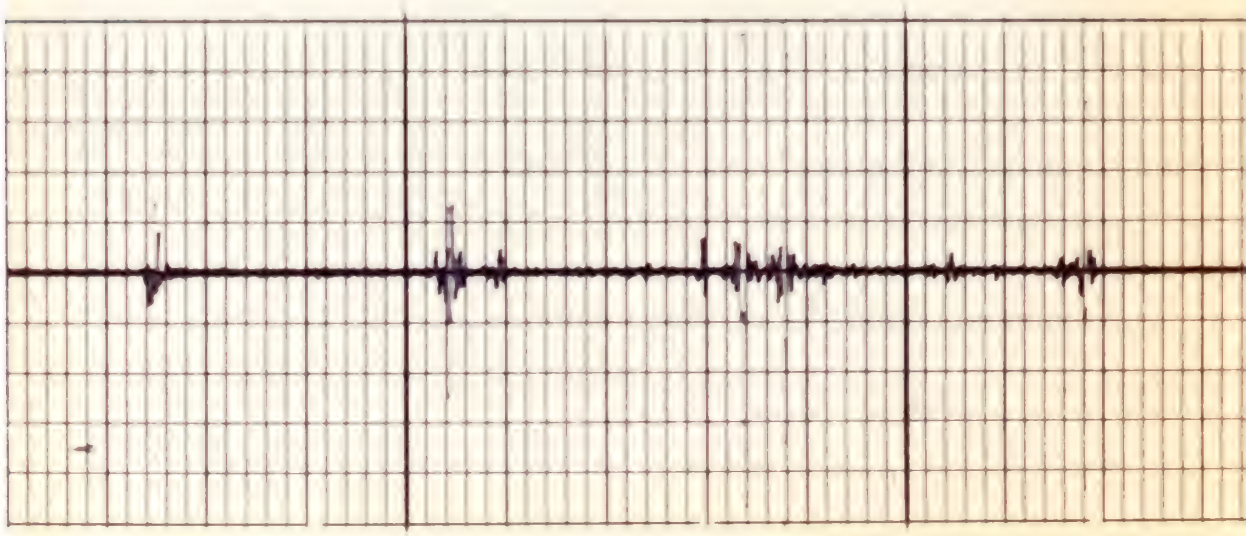
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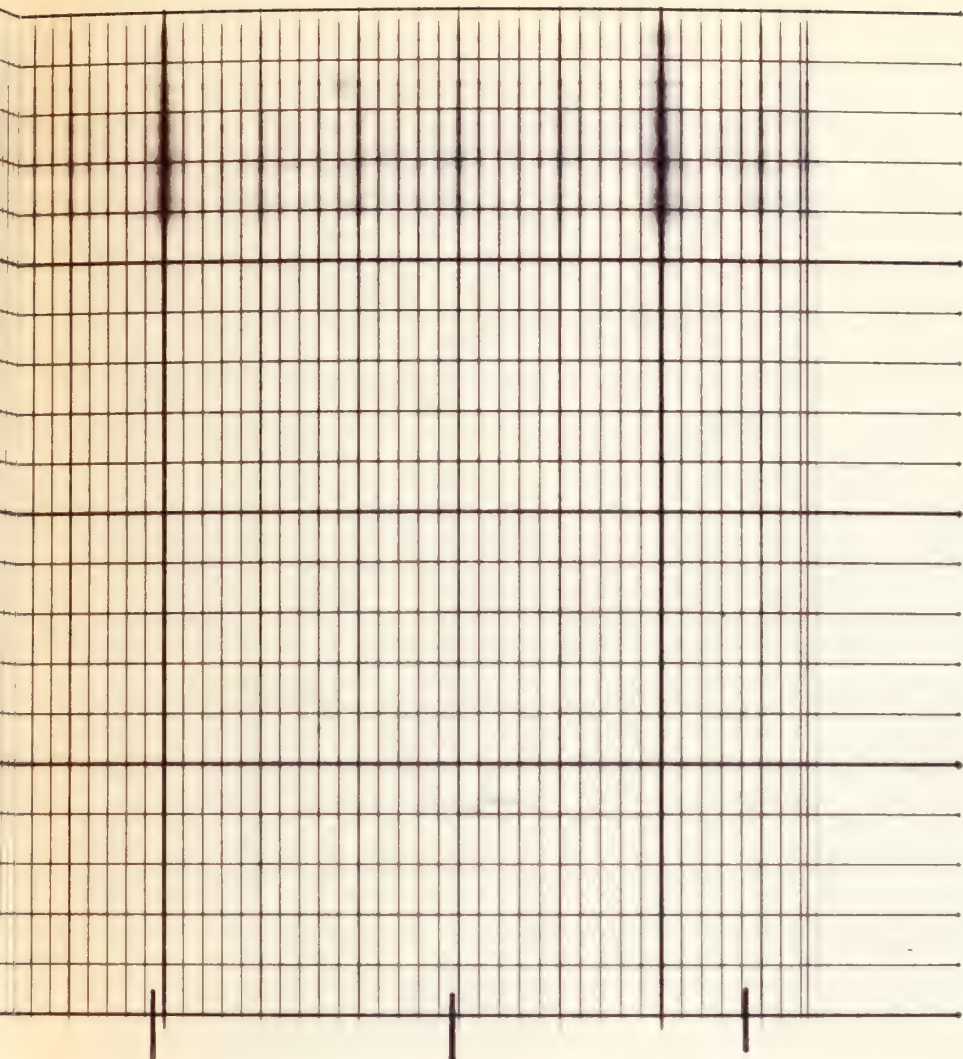
1200



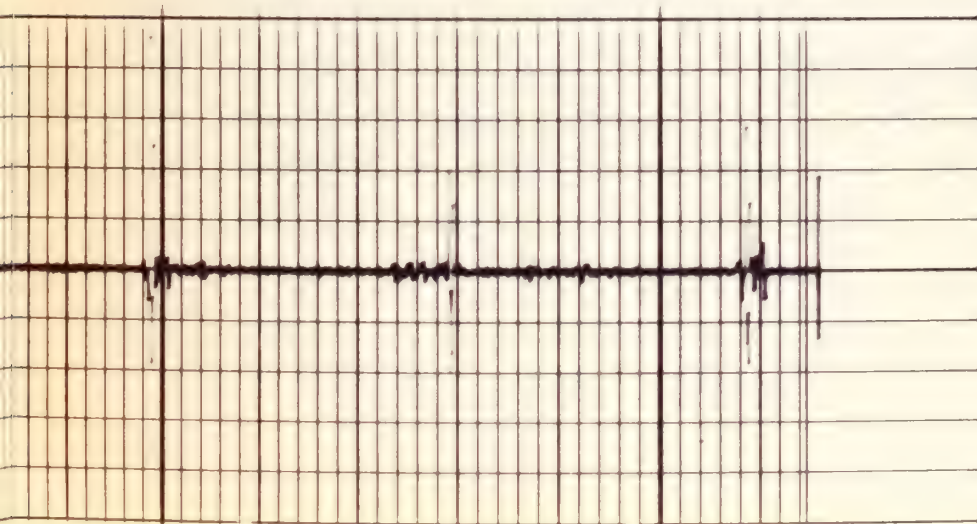


300



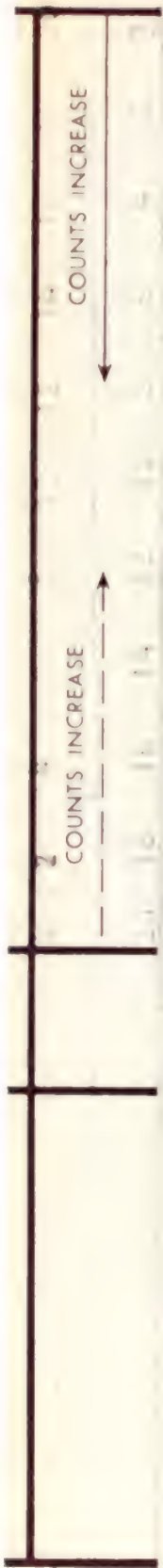


1400

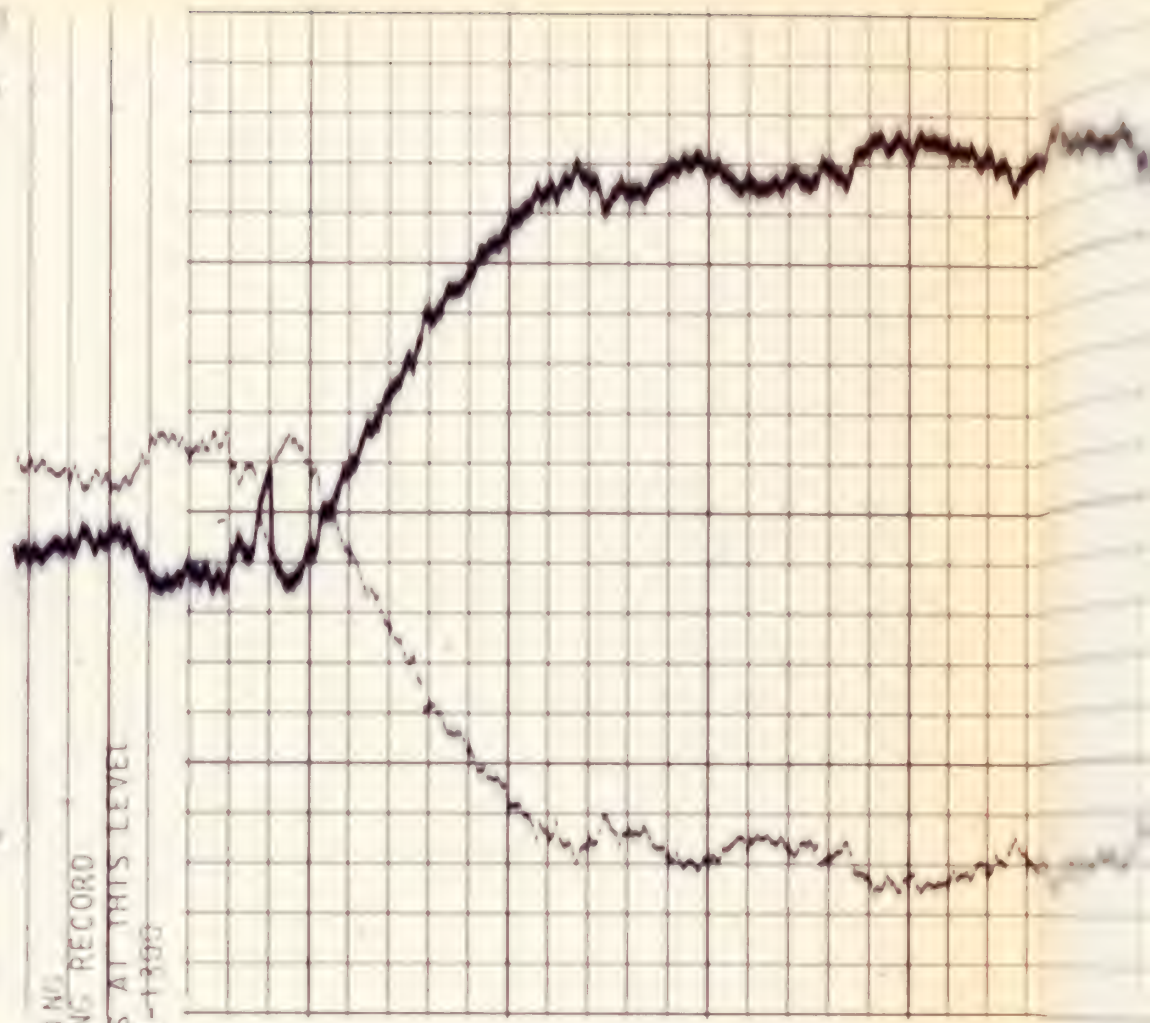
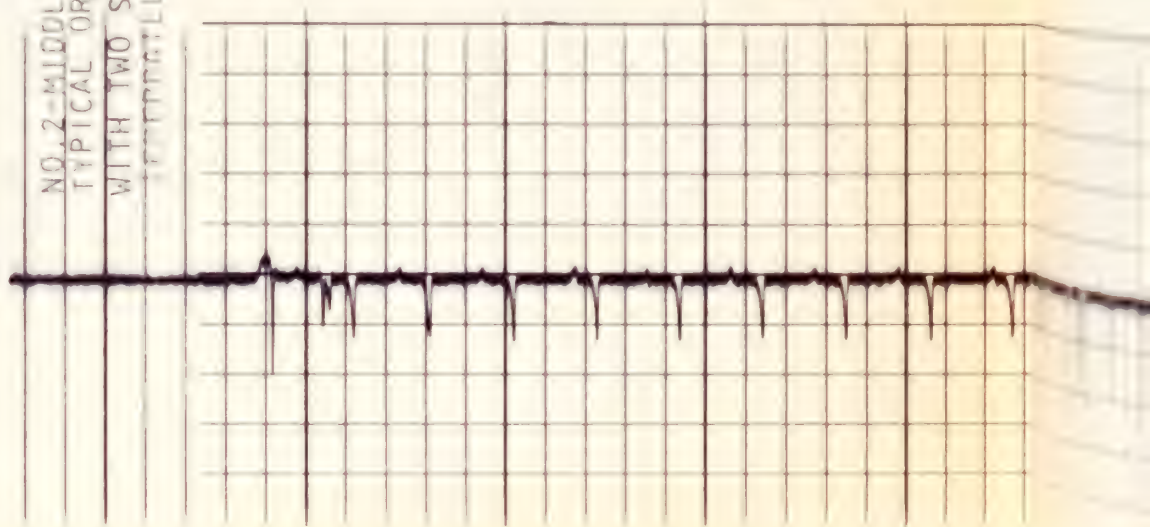


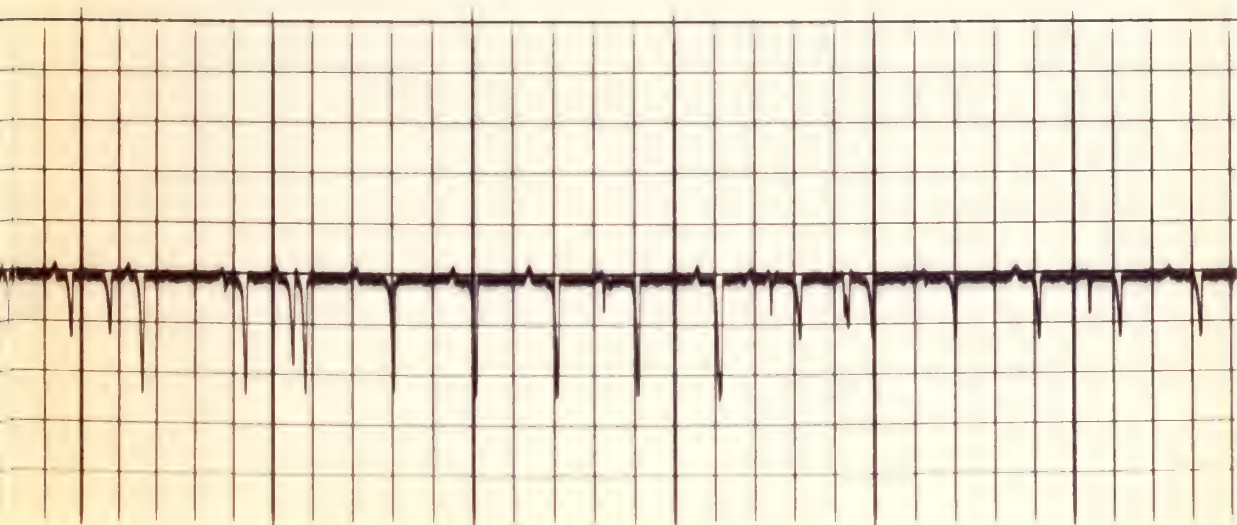
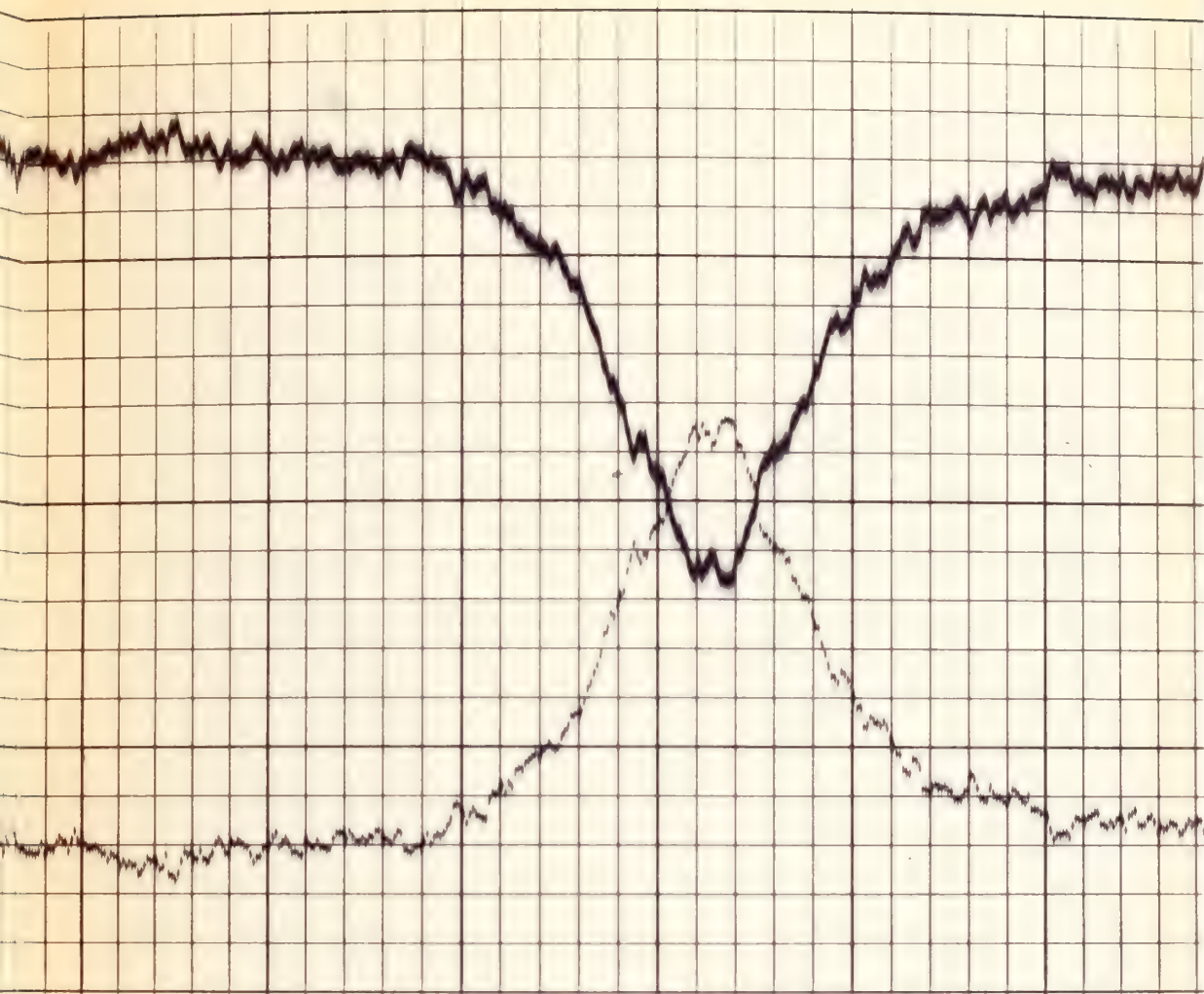
RADIIORIENTATION
RECORD

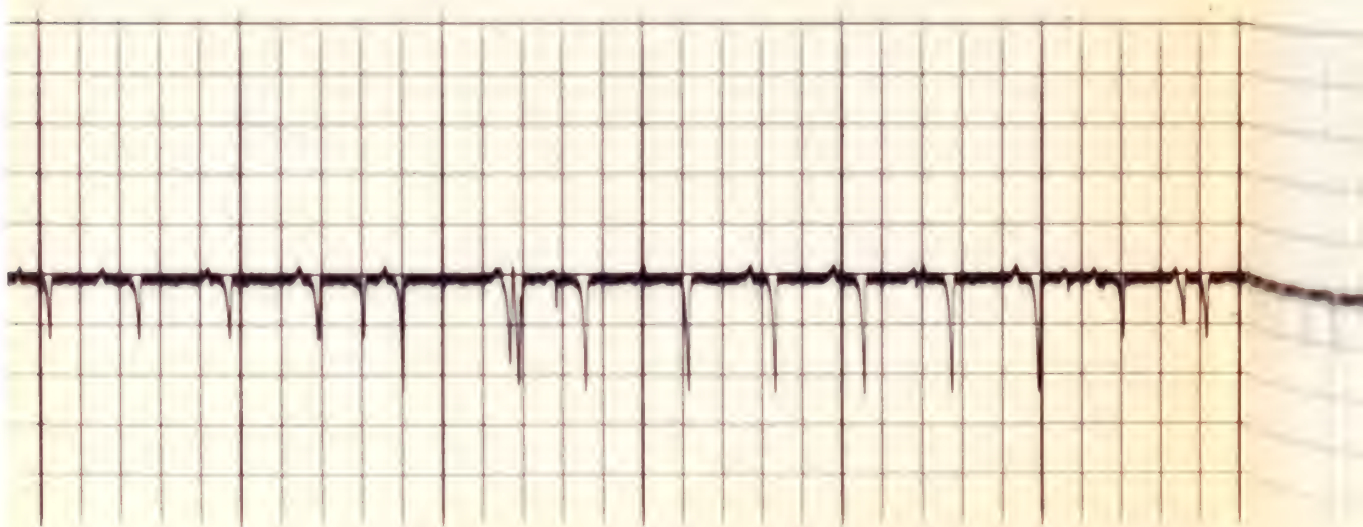
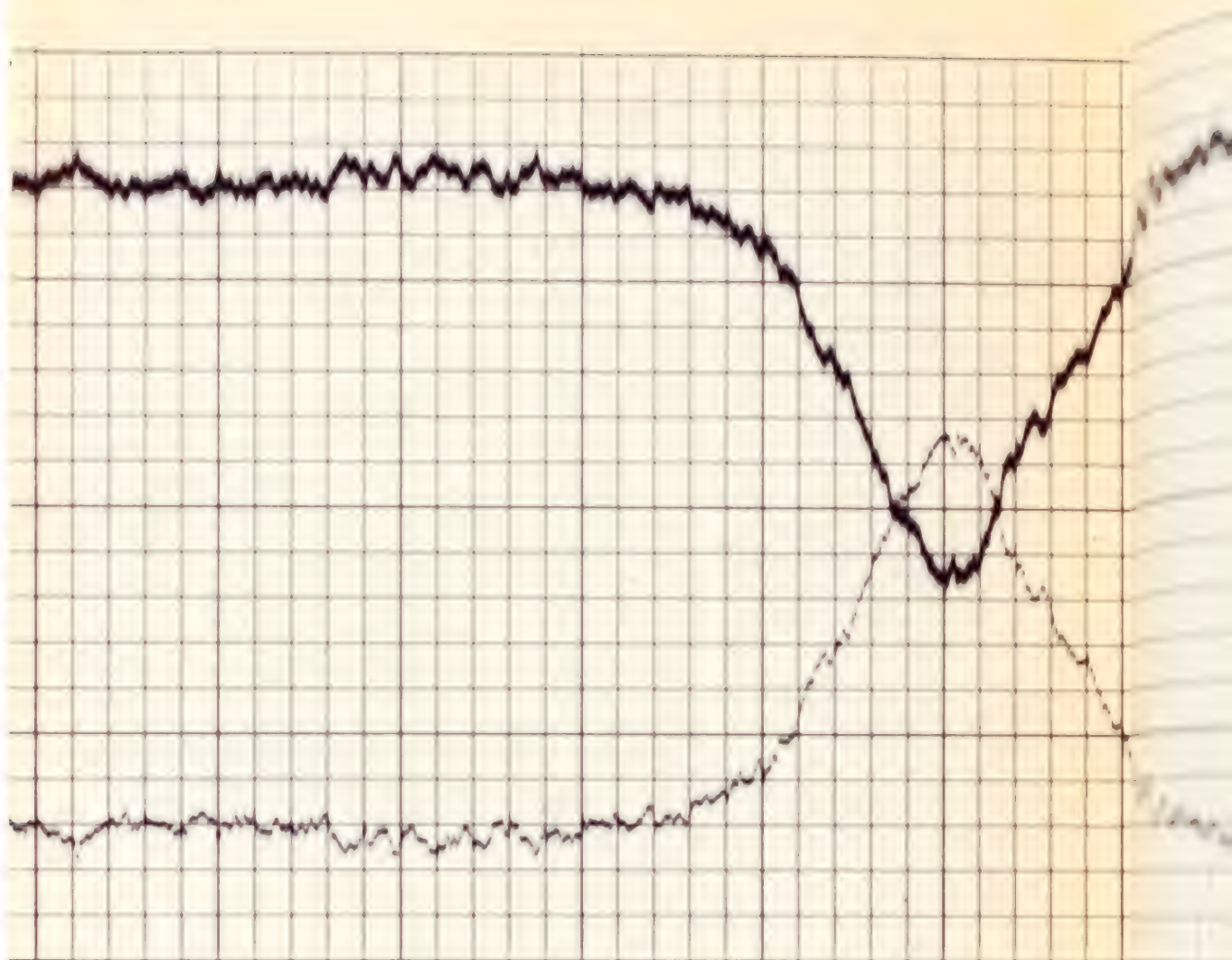
INDEXING
RECORD

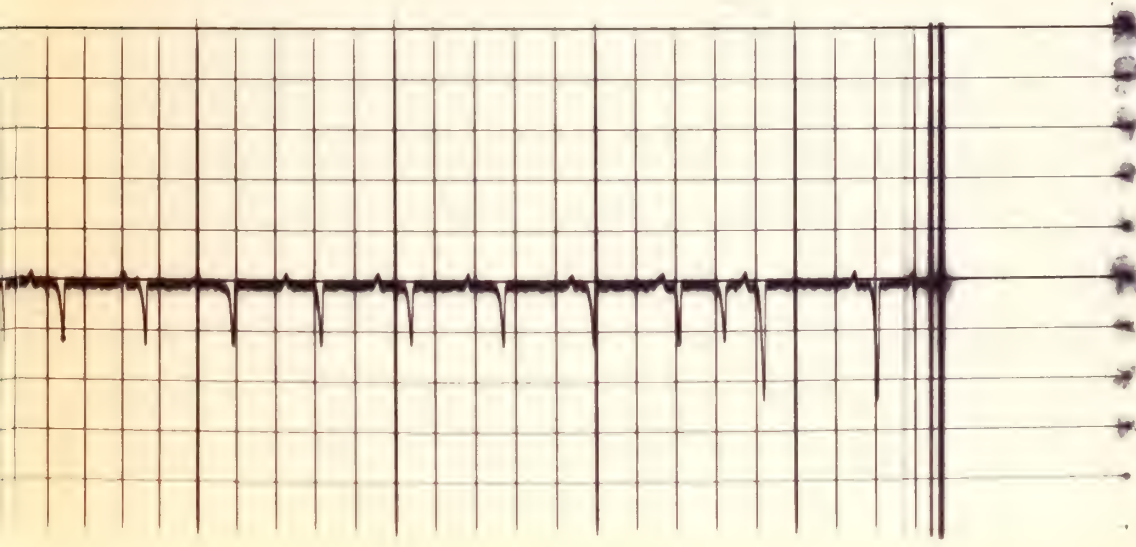
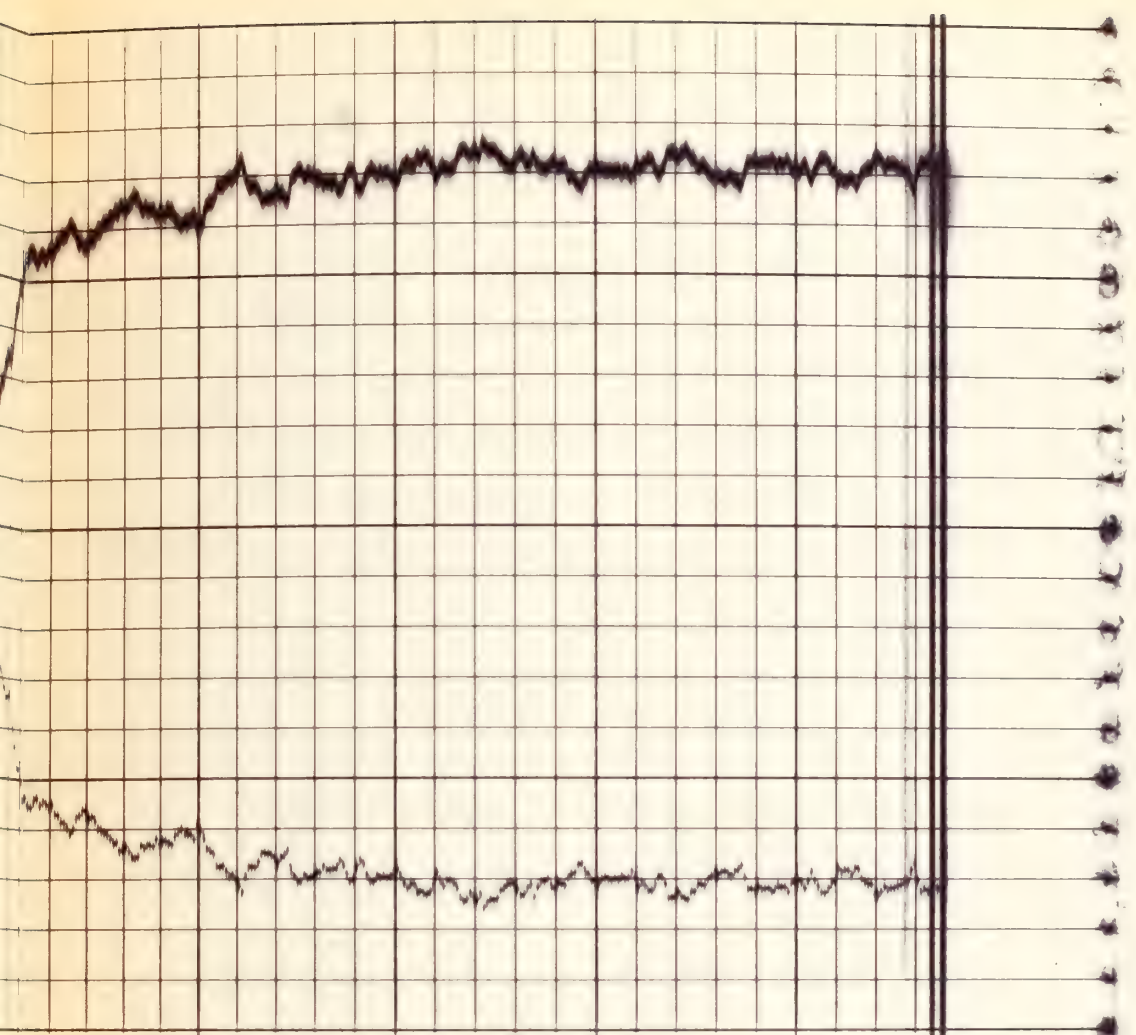


NO. 2-MIDDLE STRING
TYPICAL ORIENTING RECORD
WITH TWO STRINGS AT THIS LEVEL
CORRELATED 1298-1300







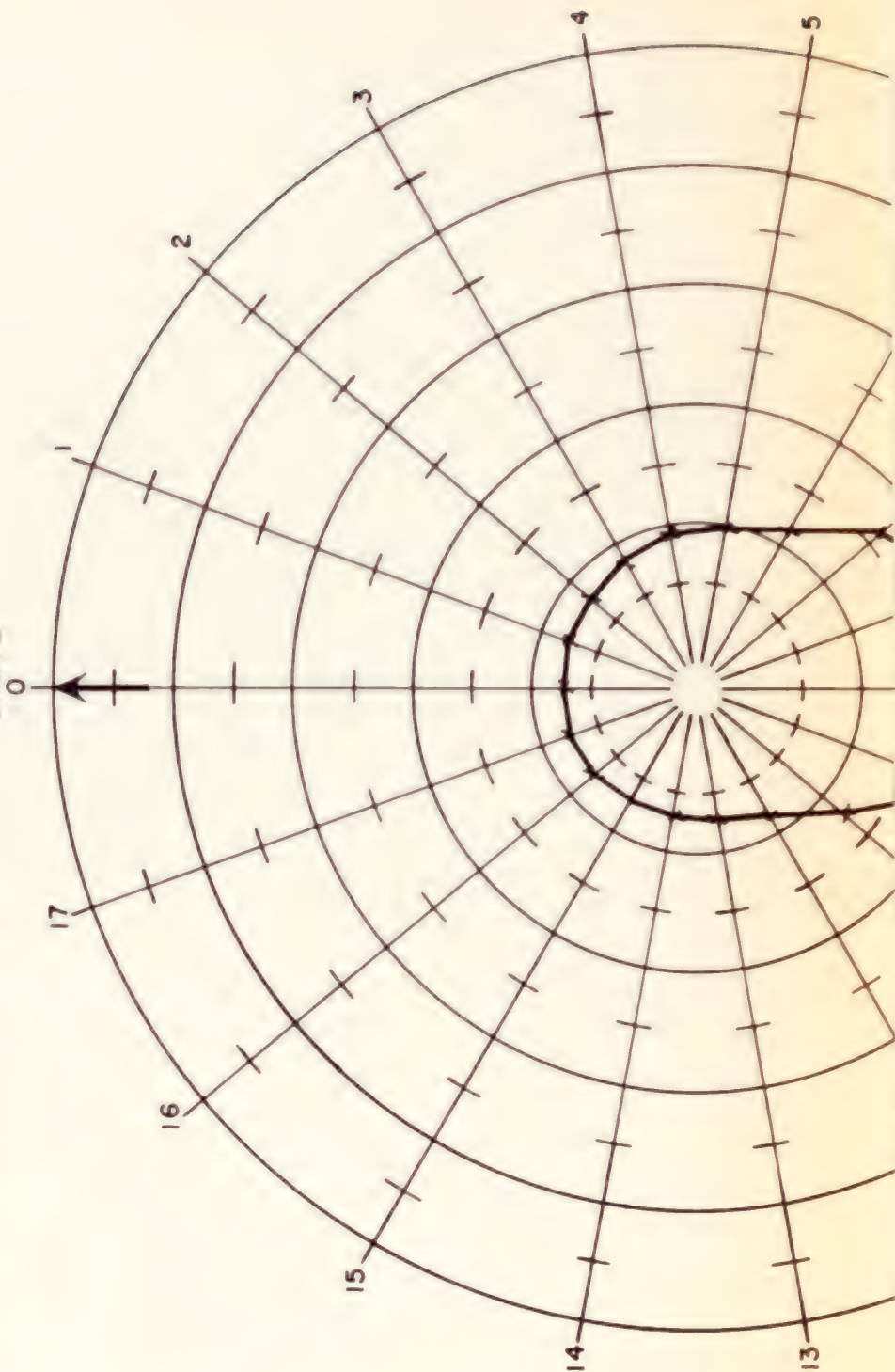


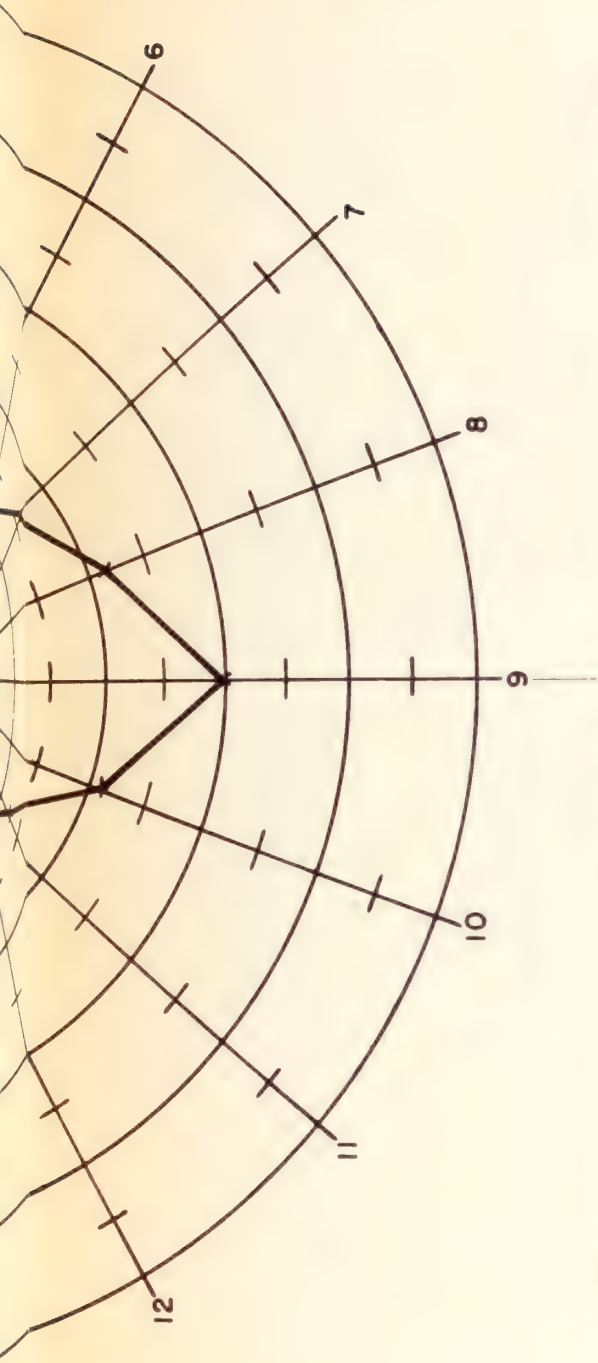
RADIOORIENTATION PLOT

POT-B

NO. 2-MIDDLE STRING PERFORATED 1293-1503 ONE SHOT PER FOOT WITH 1 1/16" HIPERDOME -
PLOT MADE FROM ABOVE ORIENTING RECORD.

SHOTS





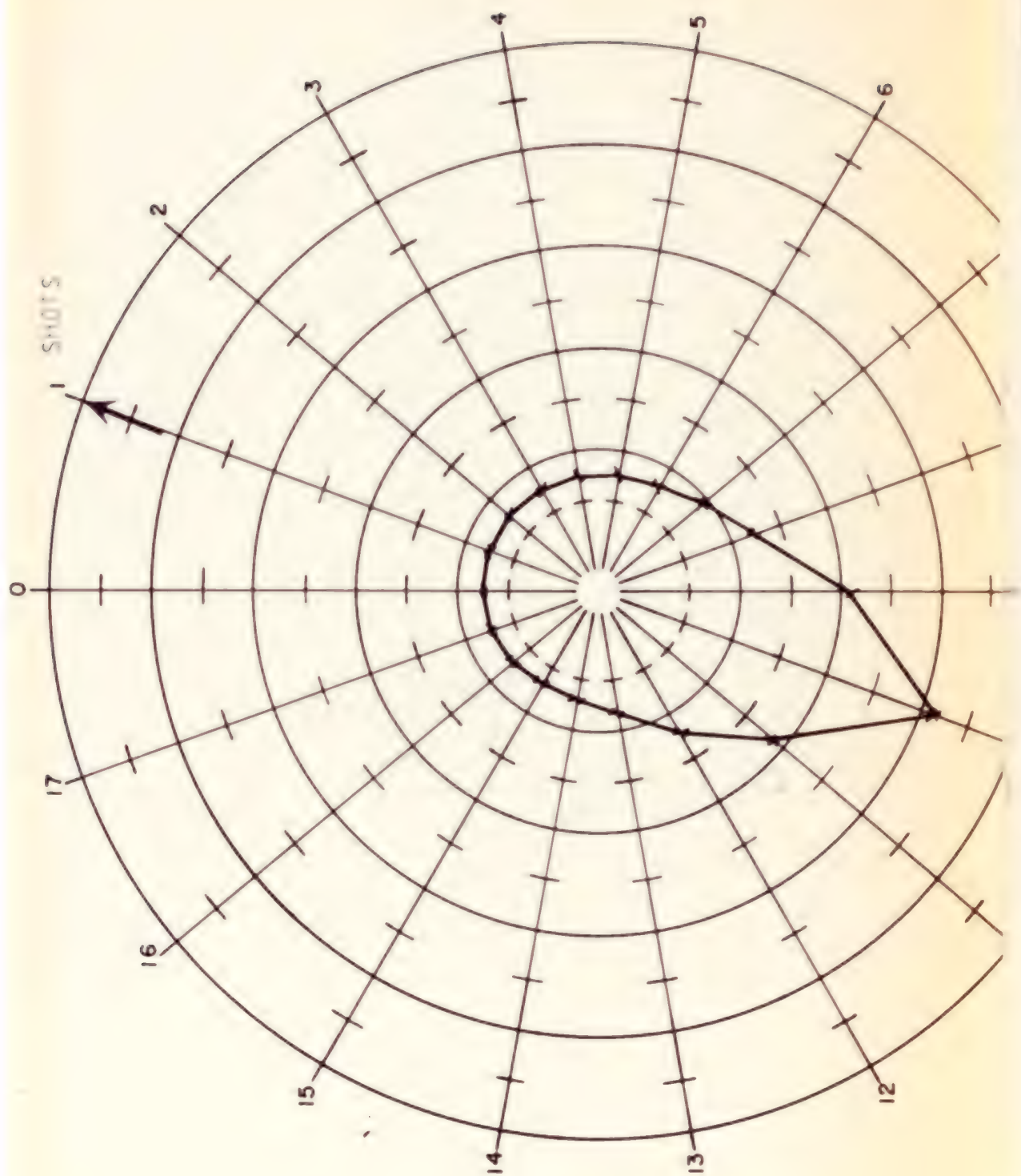
This chart, computation and/or interpretation of our readings from our gamma gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by variant metal in the drill hole and other conditions unknown to us.

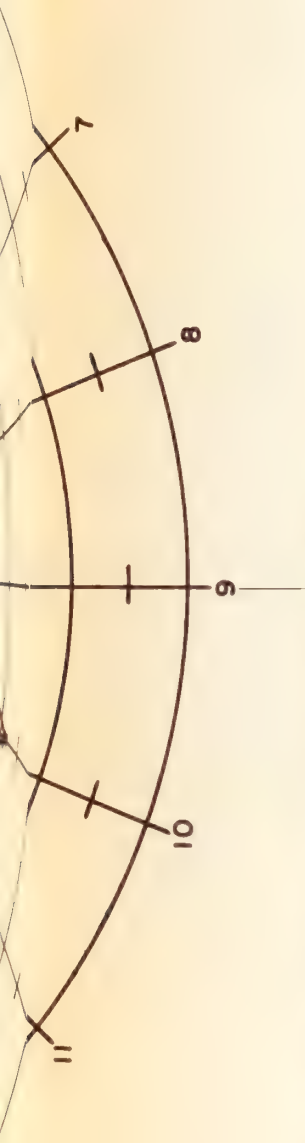
Schlumberger

RADIORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1279-1289 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





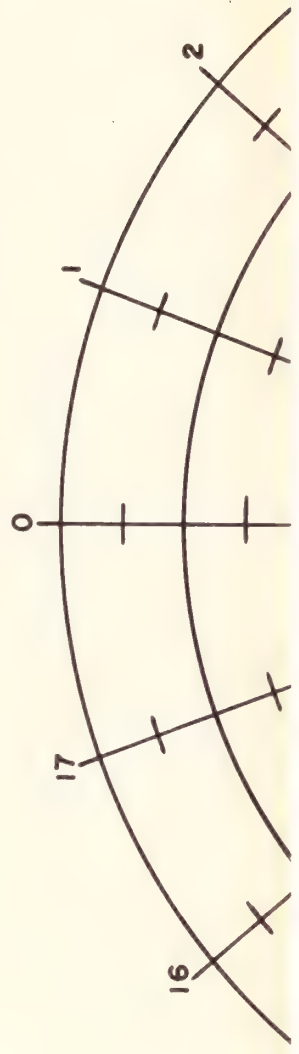
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

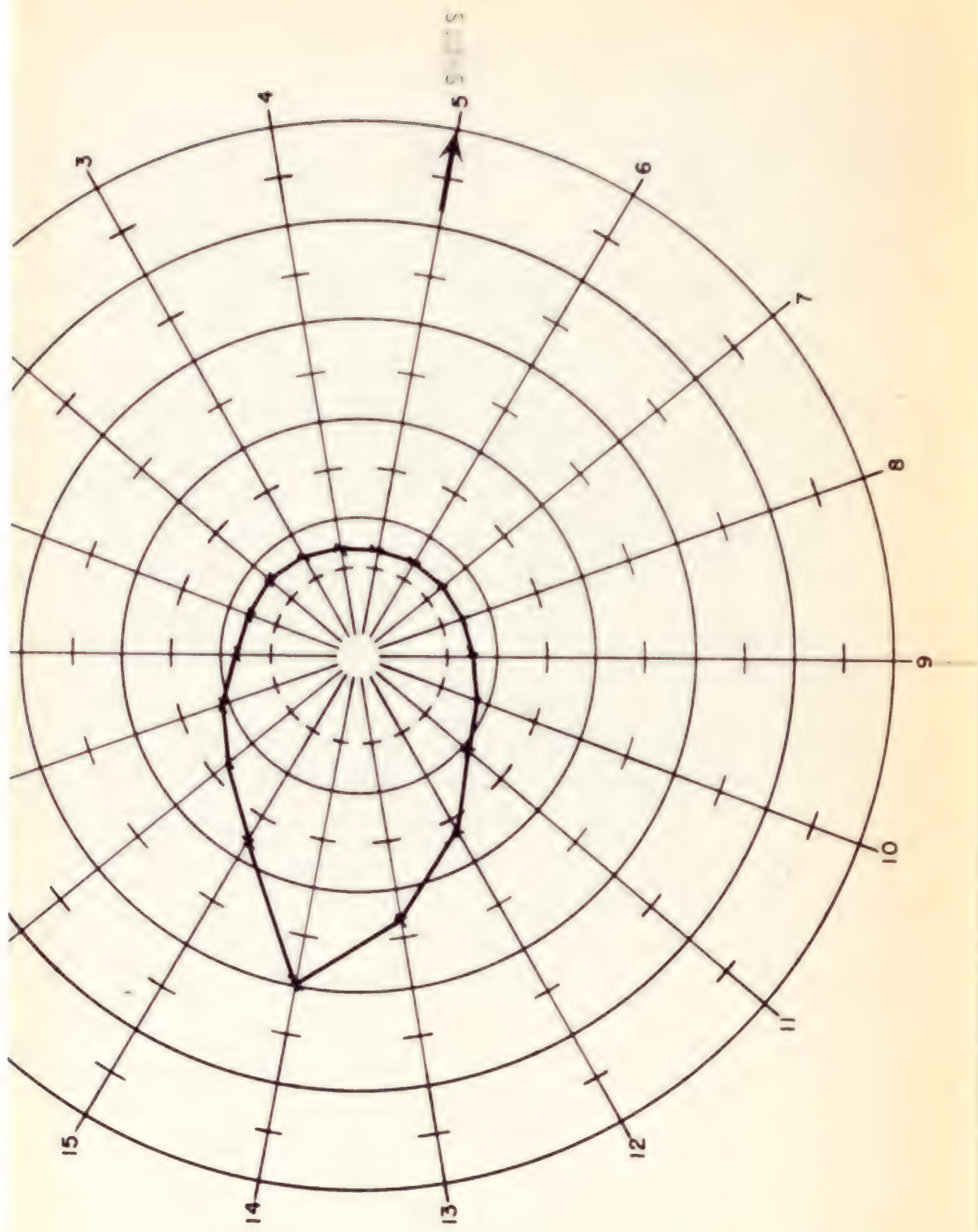


RADIOORIENTATION PLOT

POT-B

NO.2 MIDDLE STRING PERFORATED 1268 1278 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





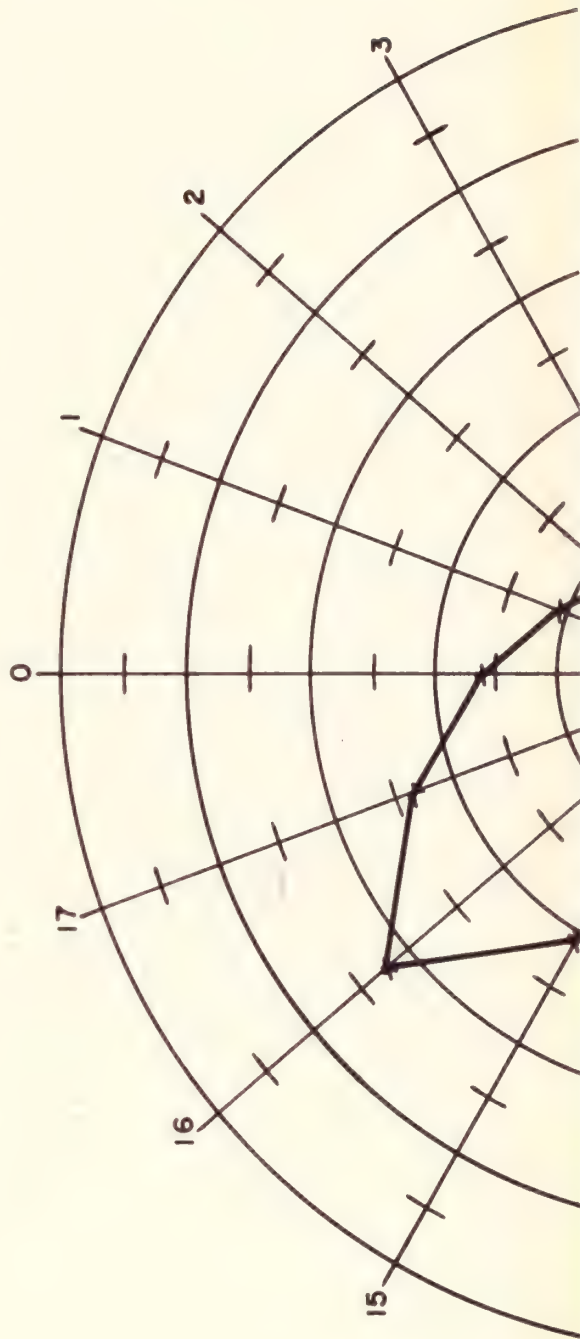
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

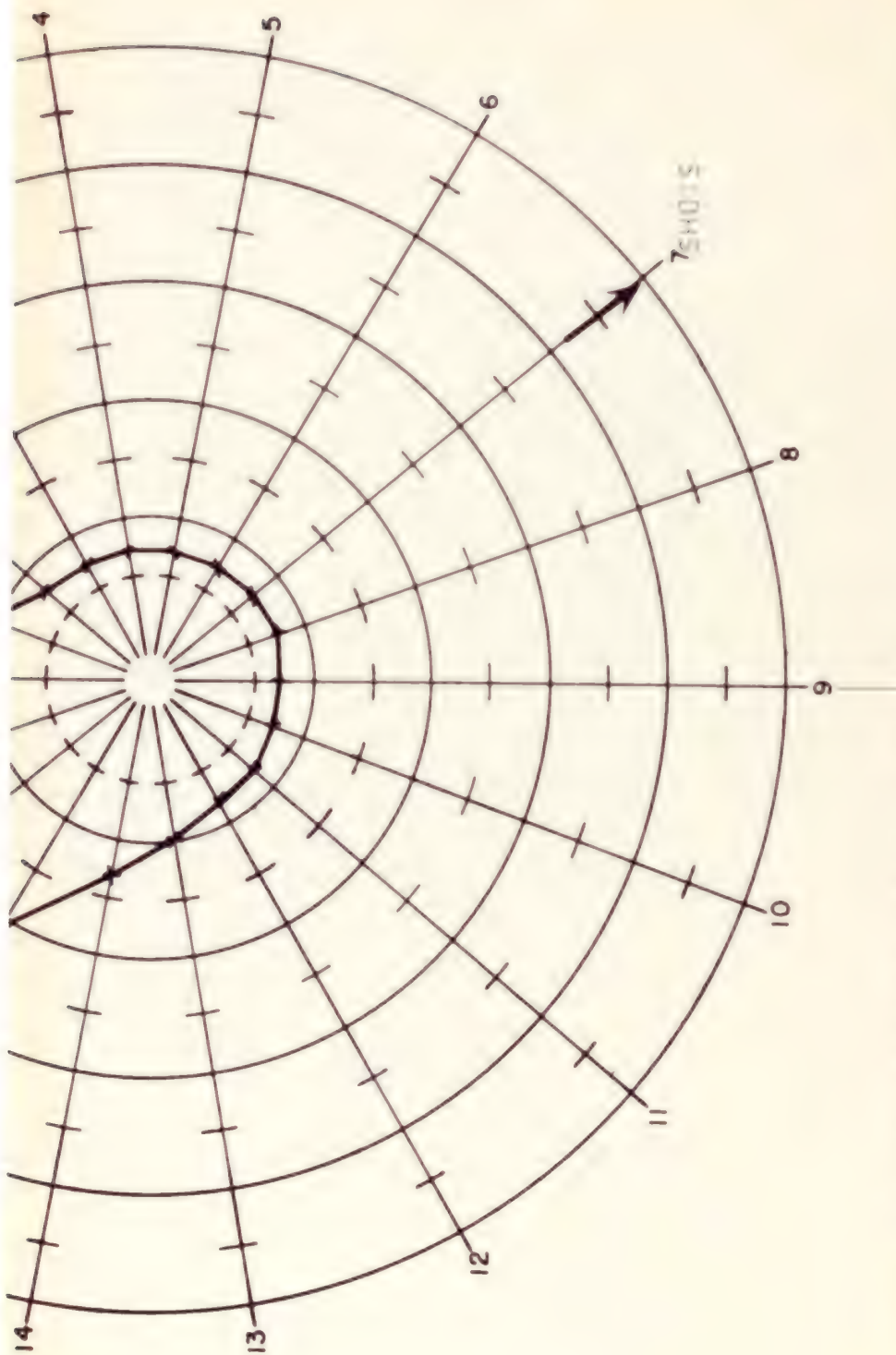
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1257-1267 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





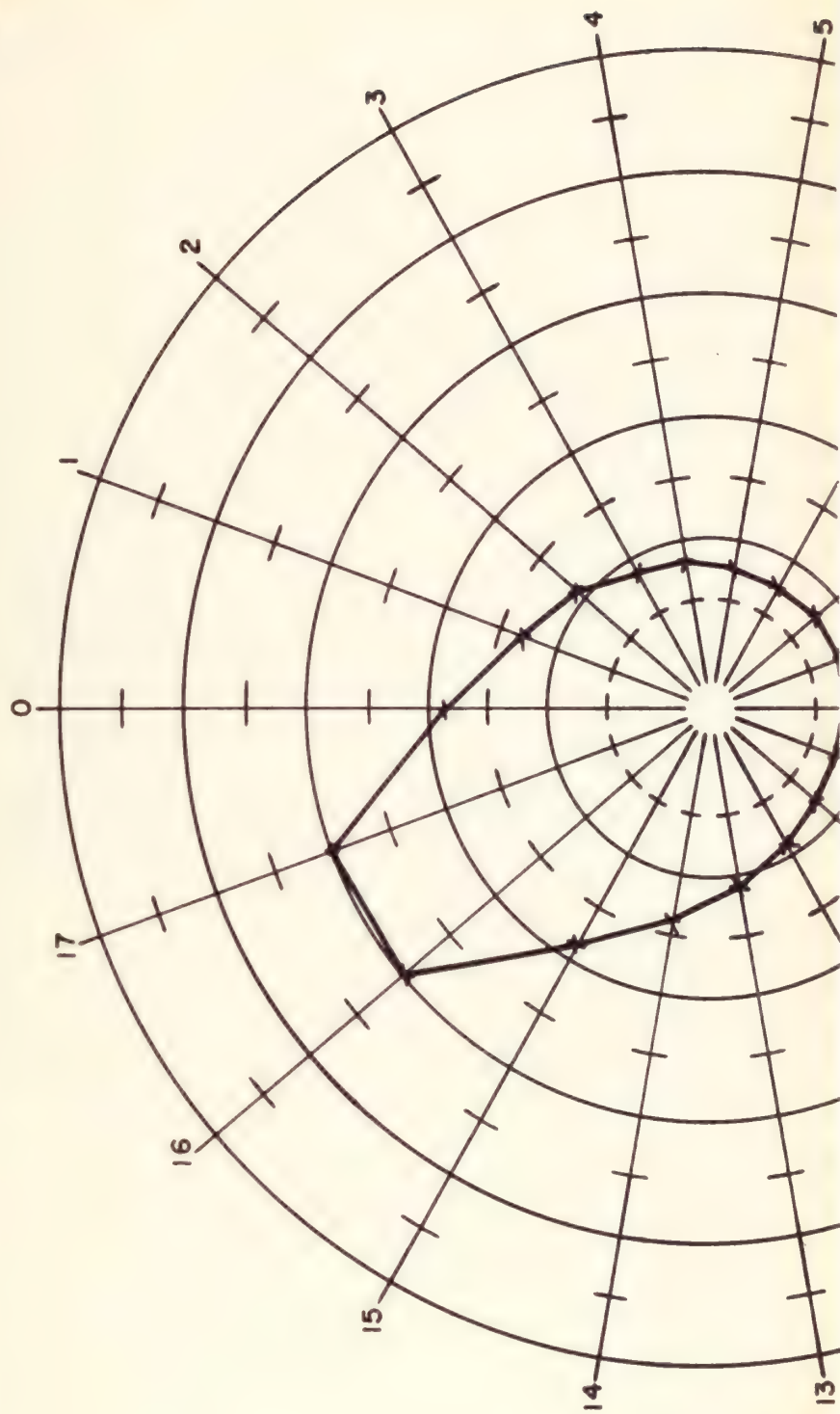
This chart, computation and or interpretation of our readings from our gamma-gamma attenuation and reflecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions, as are set out on pages 1 and 2 of our current Price Schedule and which are set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

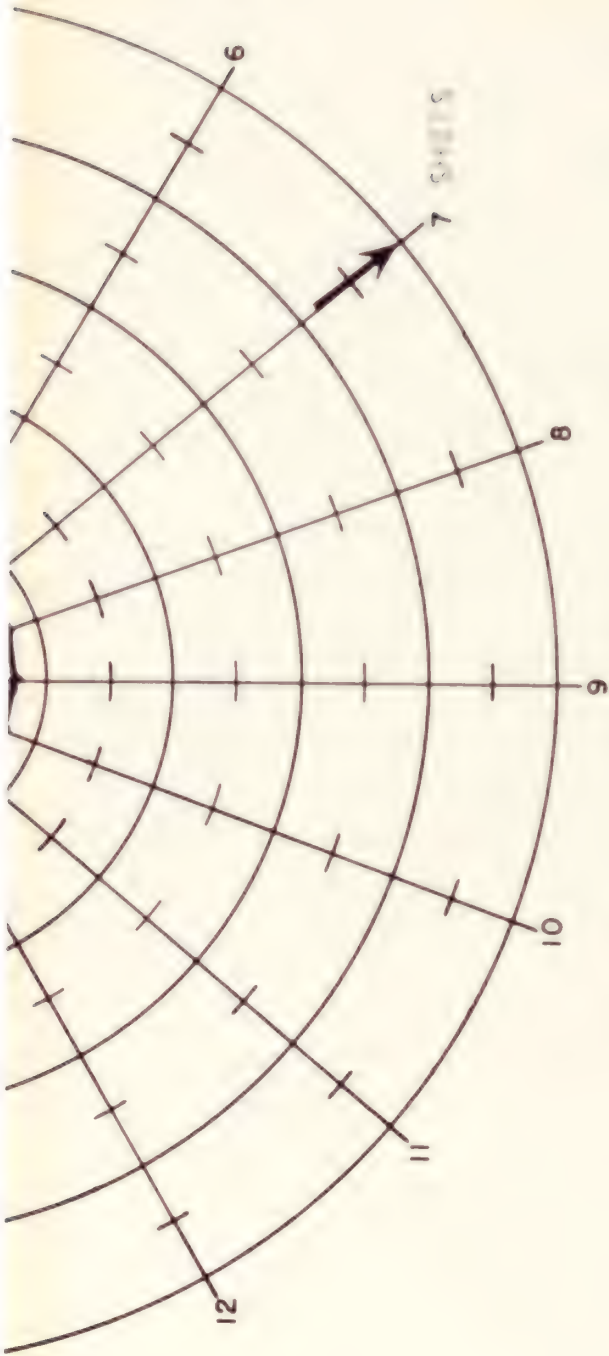
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 12 4 5-12 5 6 ONE SHOT PER FOOT WITH 1 1 1/16" HYPERDOME



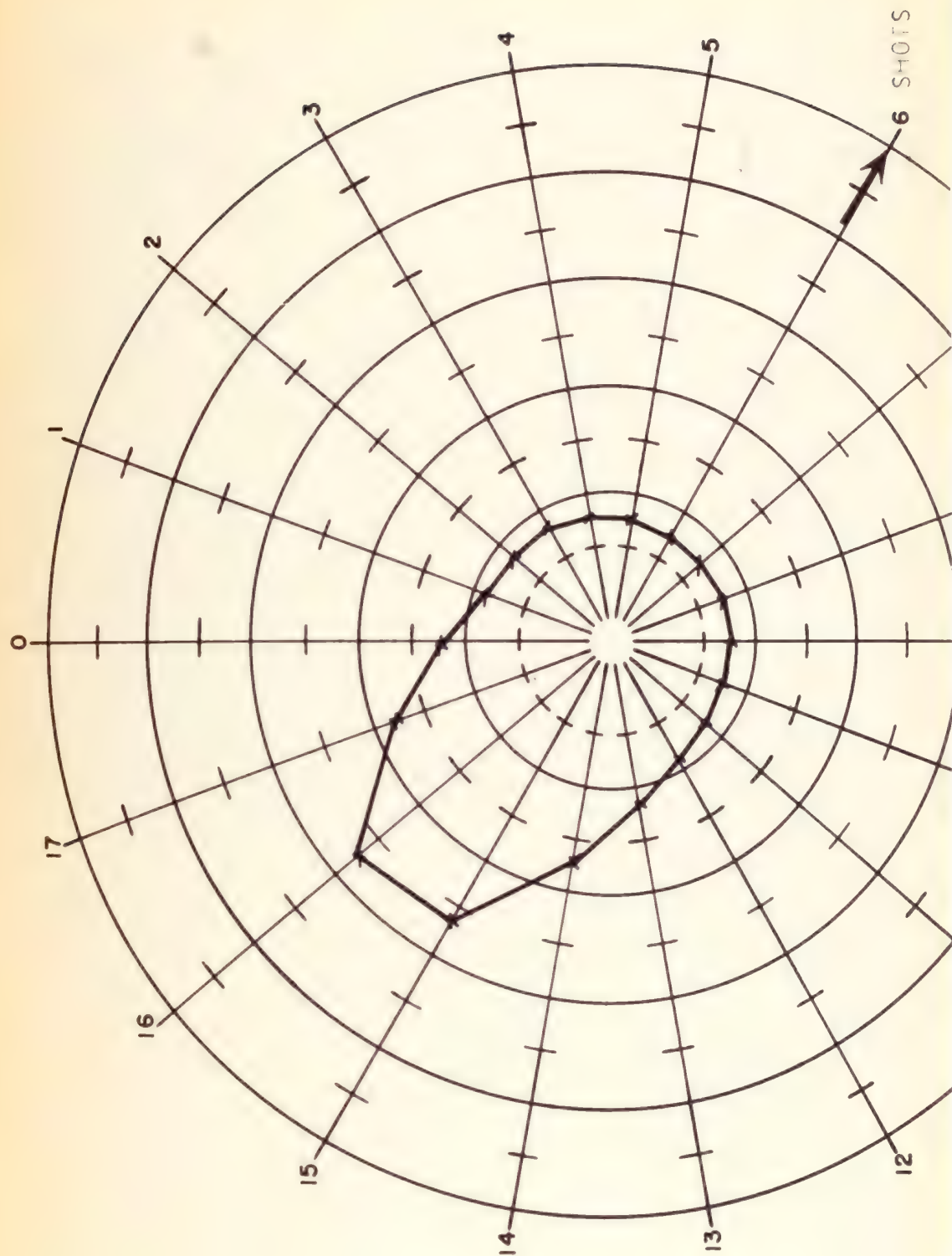


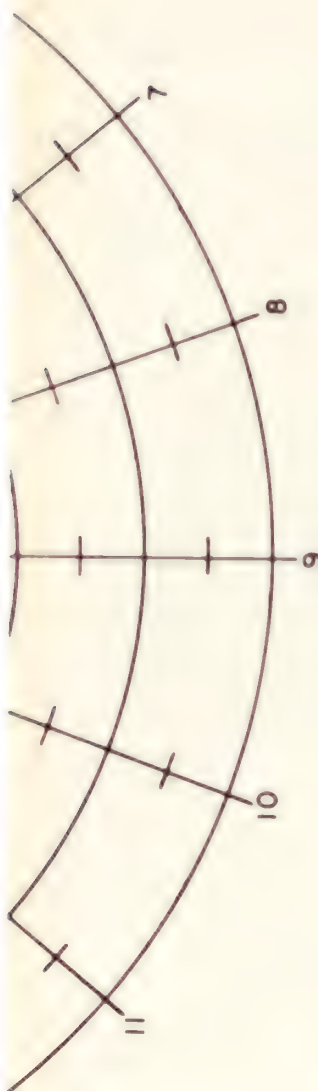
This chart, computation and/or interpretation of our readings from our gamma-ray detector and its
 lecting instrument is presented to you in confidence with, but subject to, the Gamma Rays and Radiation
 as are set out on pages 1 and 2 of our current Price Schedule and which you are to use for the entire
 side of our Service Order for this job. The readings could be adversely affected by constant noise in the
 drill hole and other conditions unknown to us.

Schlumberger

RADIORIENTATION PLOT

POT-B

RADIOREINTEGRATION PLOT
P. 1001



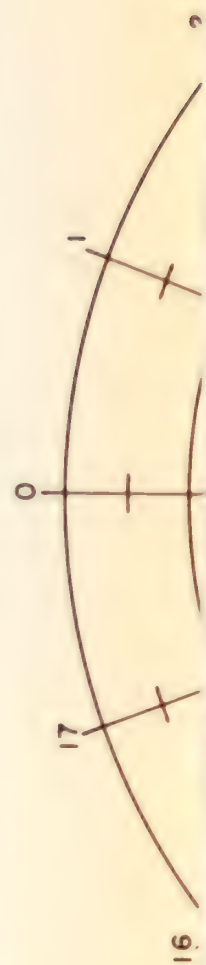
This chart, computation and/or interpretation of our readings from our gamma-gauge instrument are for the
 testing instrument is presented to you for information only. But subject to the laws of physics and fluid mechanics
 as are set out on pages 1 and 2 of our General Purpose Orientation and Interpretation of our Service Order for this job. The readings must be adjusted according to various factors in the
 drill hole and other conditions unknown to us.

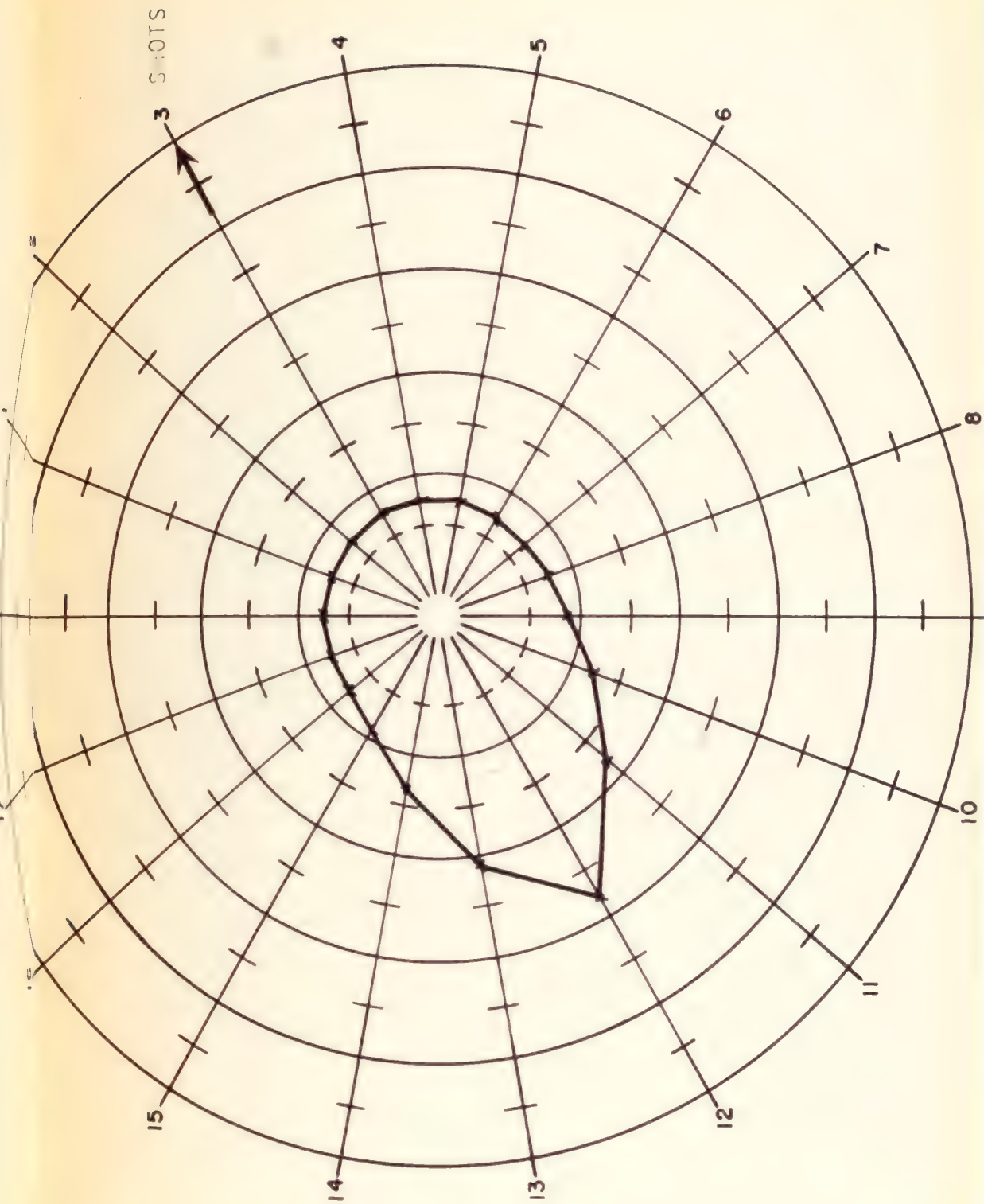
Schlumberger

RADIORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1224-1234 ONE SHOT PER FOOT WITH 1 1/2 16" HYPERBOLIC





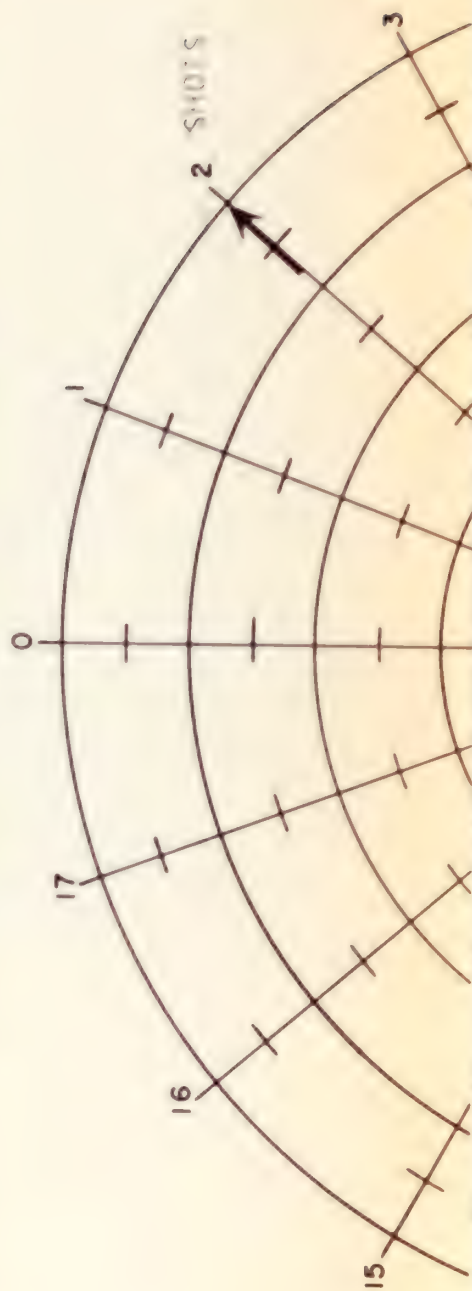
This chart, compilation and/or interpretation of our readings from our geophysical instrument and the logging instrument is presented to you in accordance with the terms of the license terms and conditions as are set out on pages 1 and 2 of our current Price Schedule and which are to be read with the reverse side of our license for this job. The readings may be adversely affected by conditions present in the drill hole and other conditions unknown to us.

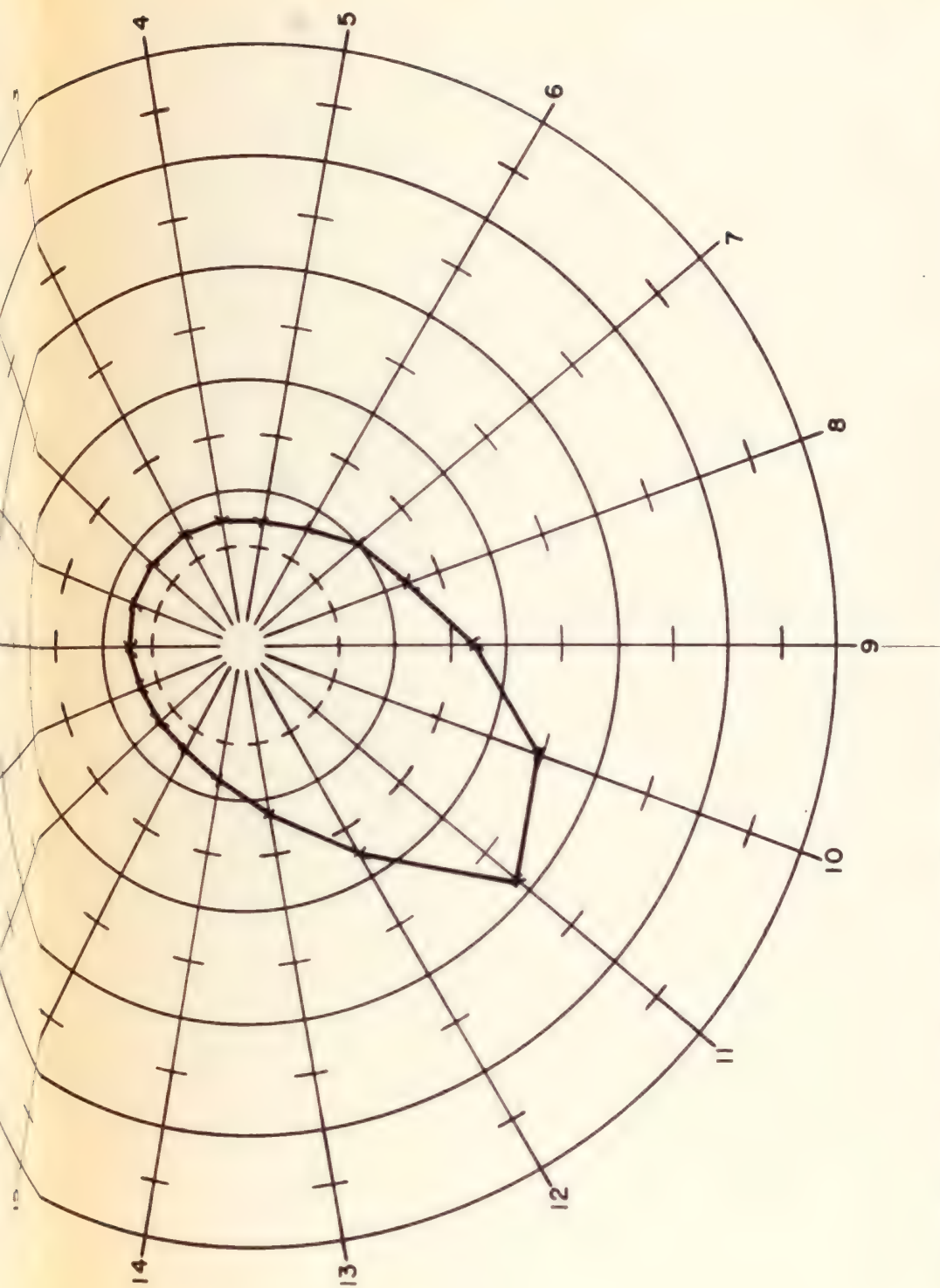
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2 MIDDLE SIRMING PERFORATED 1213-1223 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





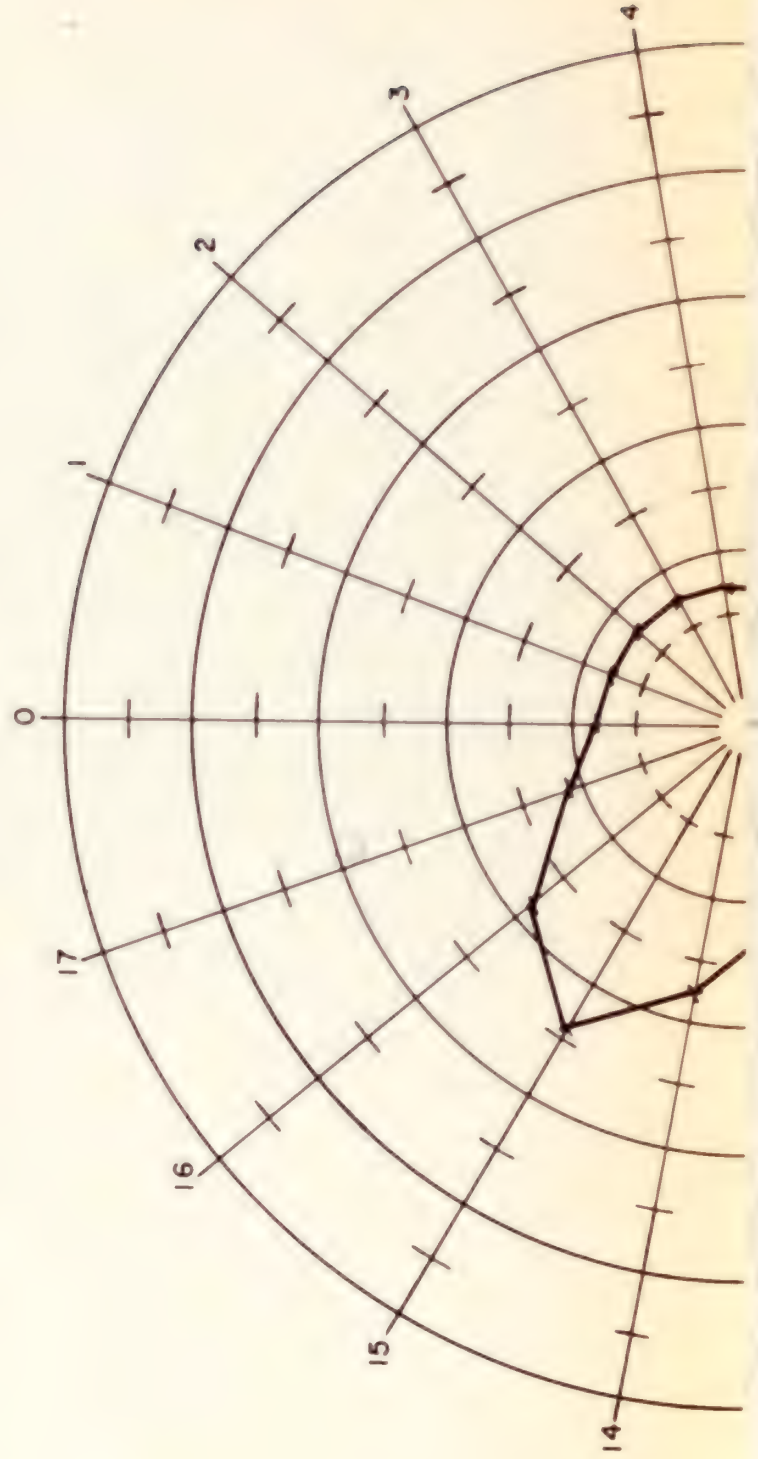
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

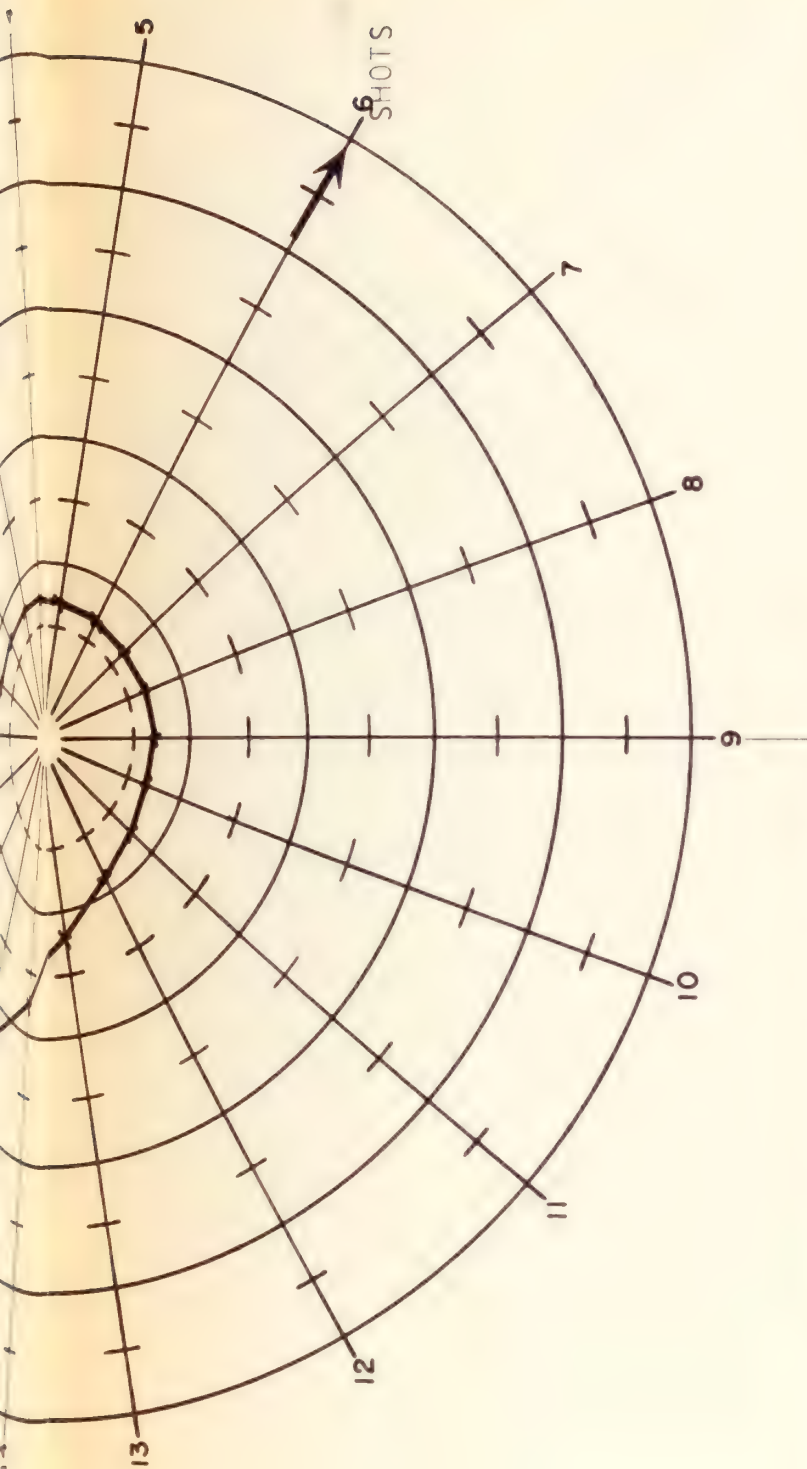
Schlumberger

RADIOORIENTATION PLOT

POT-8

NO. 2-MIDDLE STRING PERFORATED 1202-1219 ONE SHOT PER FOOT WITH 1 11/16" HYPEROOME





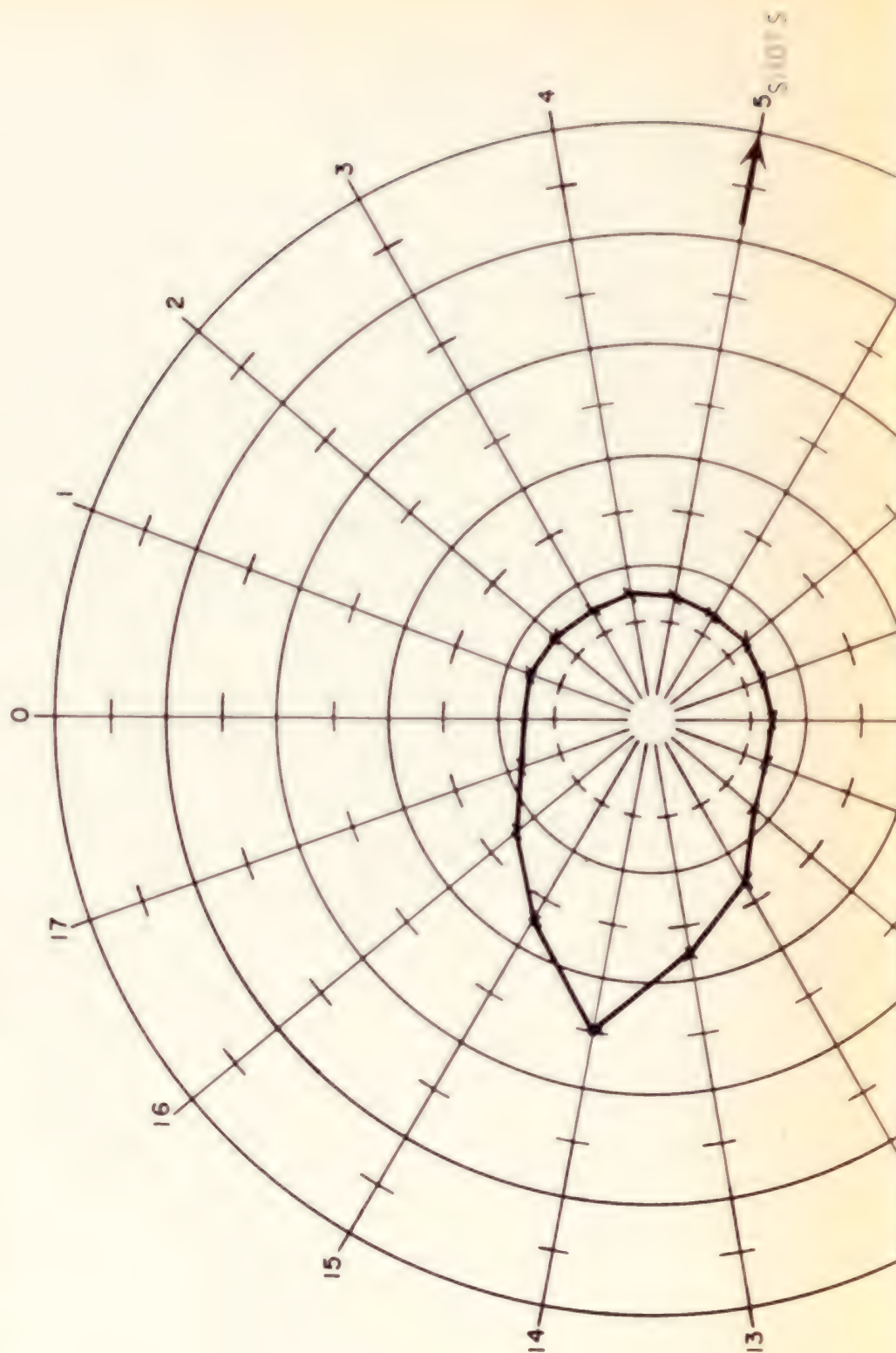
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by variant metal in the drill hole and other conditions unknown to us.

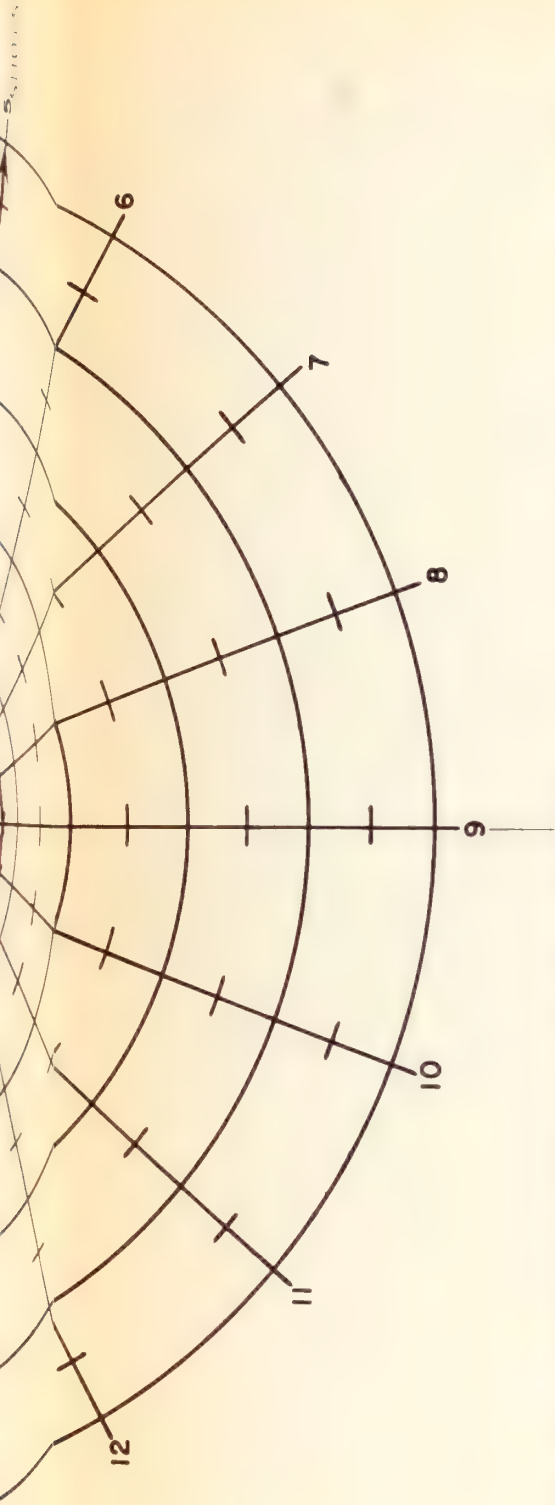
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 2-MIDDLE STRING PERFORATED 1191-1201 ONE SHOT PER FOOT WITH 1 1/2 IN. HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

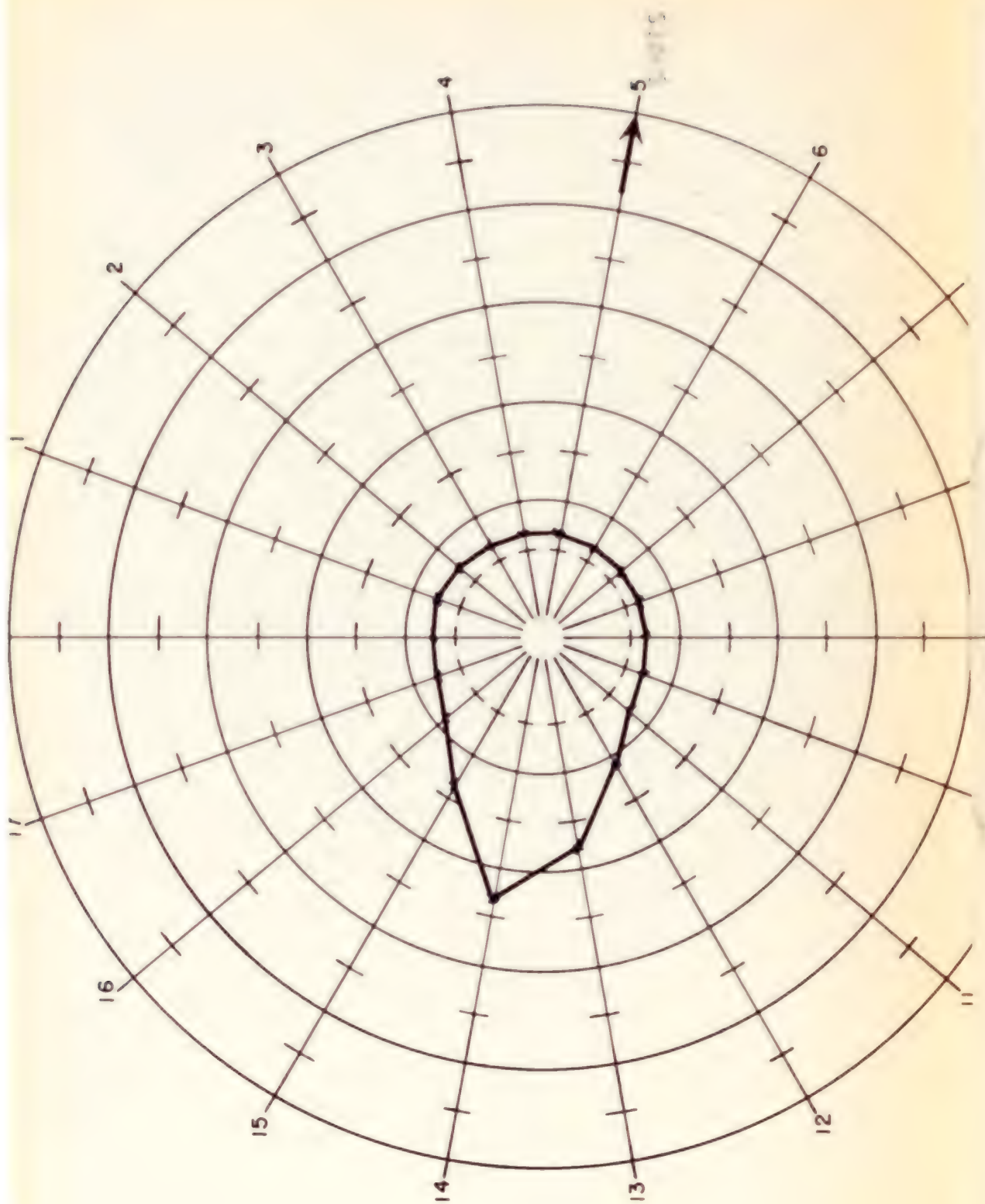
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1180-1190 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

0





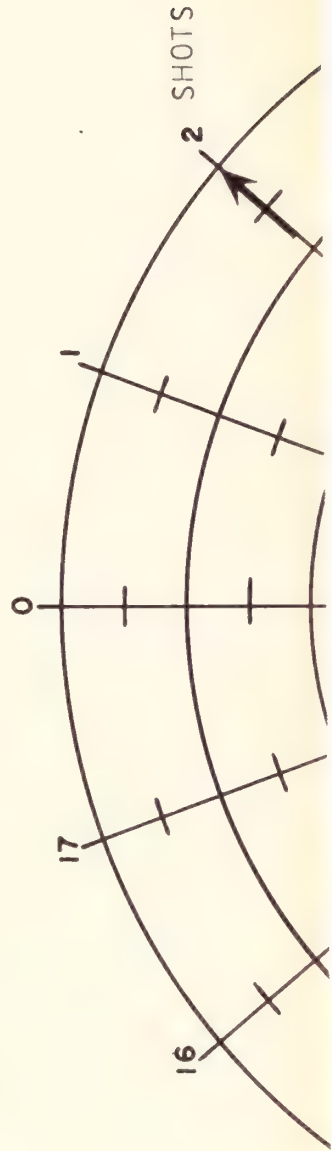
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

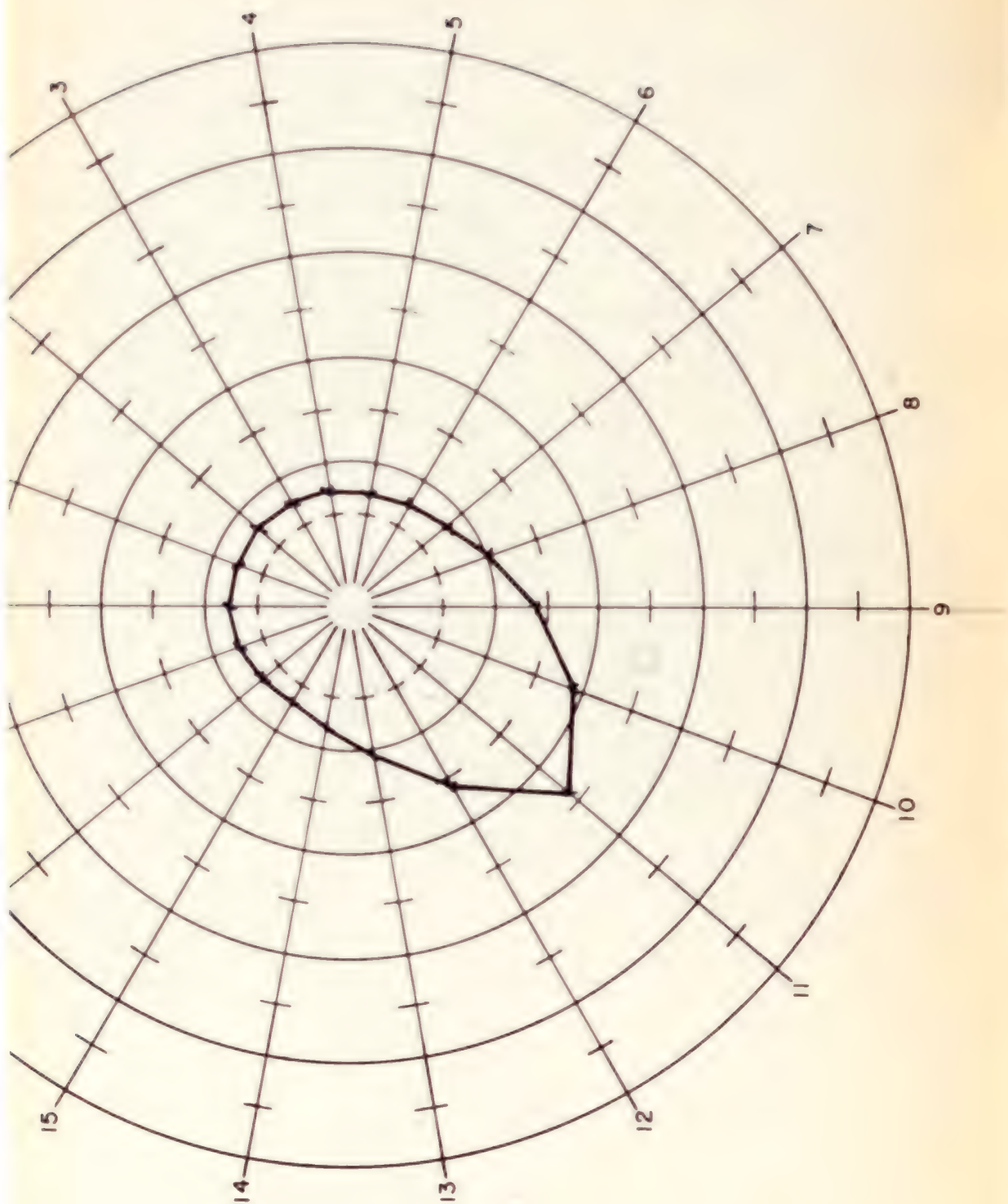


RADIO-ORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1169-1179 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





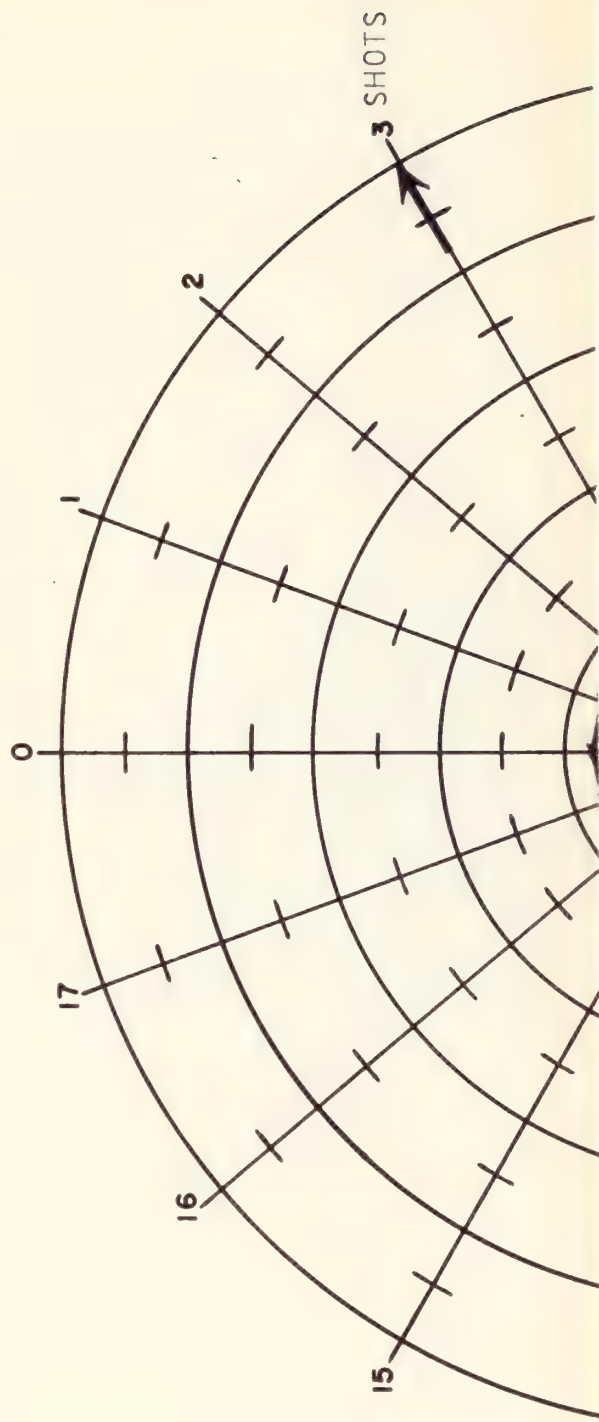
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and ge-
lecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions
as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse
side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the
drill hole and other conditions unknown to us.

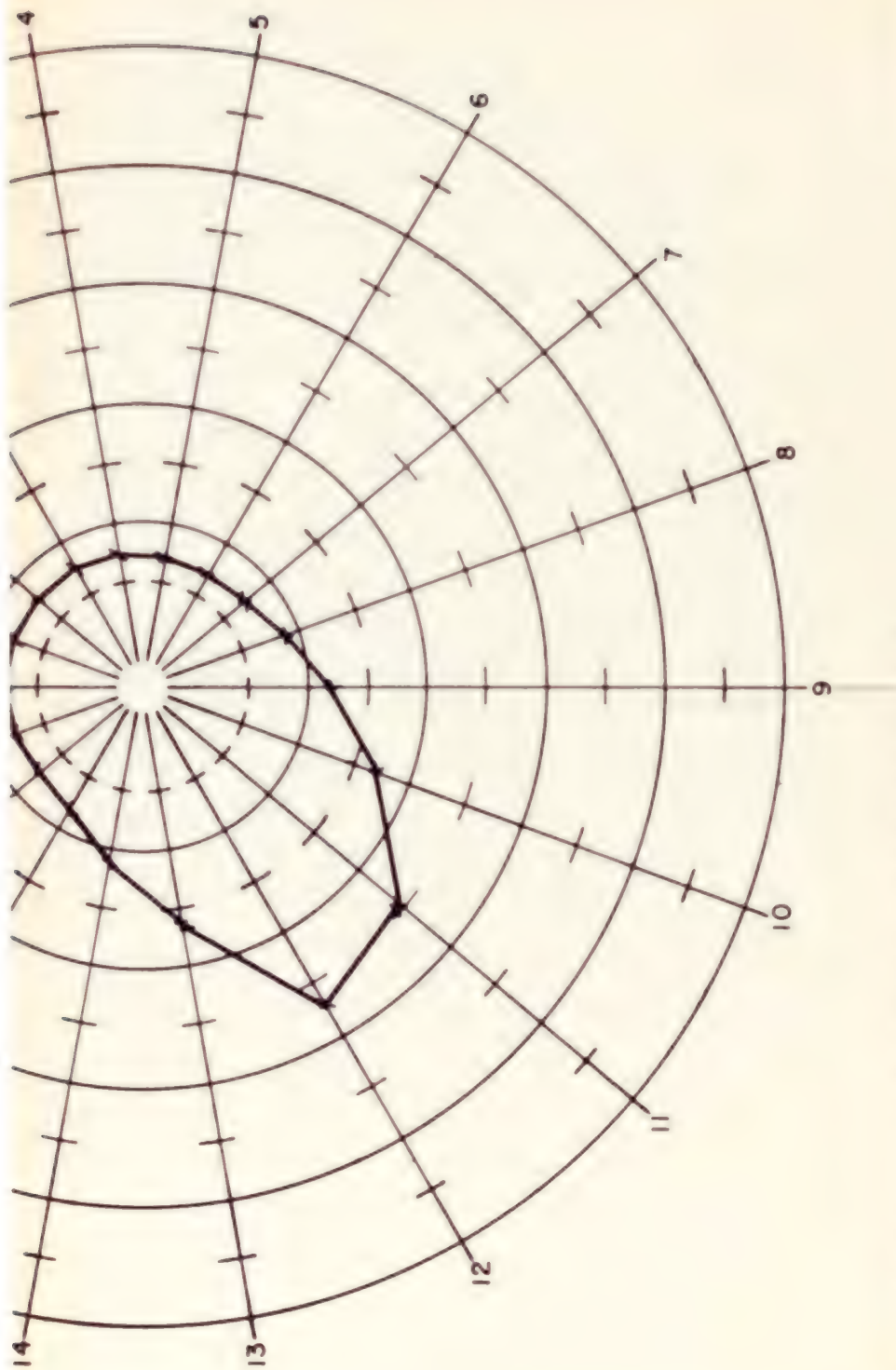
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2--MIDDLE STRING PERFORATED 1158--1168 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



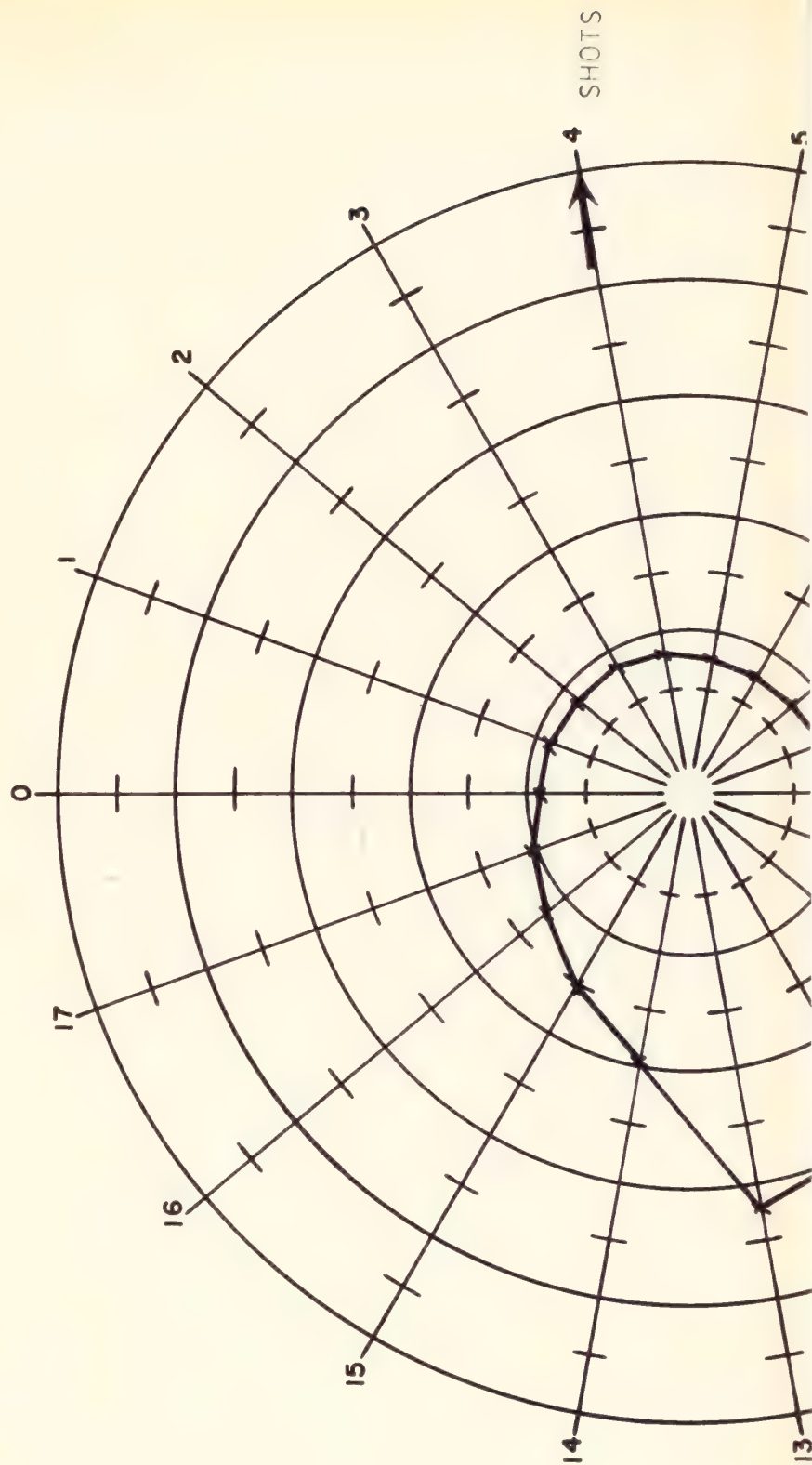


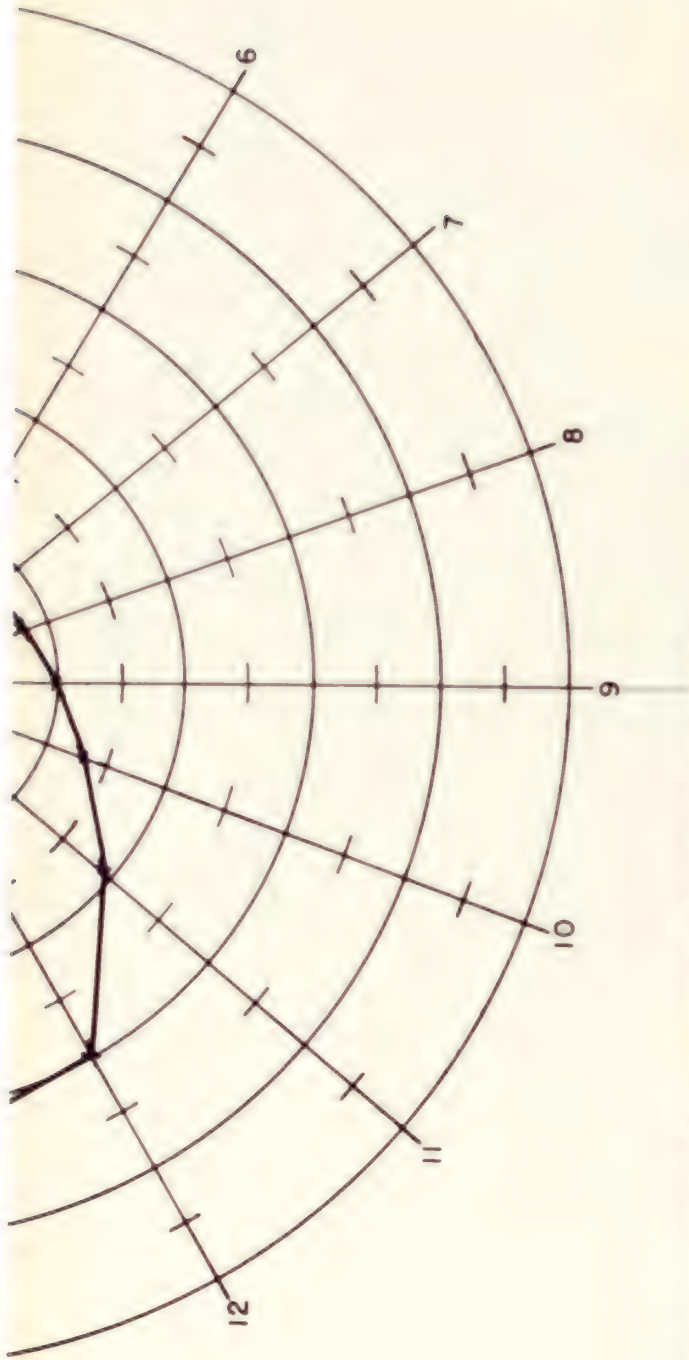
This chart, computation and/or interpretation of our readings from our Schlumberger instrument and its testing instrument is presented to you in accordance with the terms of the license agreement between us and you set out on pages 1 and 2 of our contract. Please Schlumberger and Schlumberger are not responsible for the results of our Service Order for this job. The readings could be adversely affected by irregularities in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

NO. 2 MIDDLE STRING PERFORATED 1147-1157 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





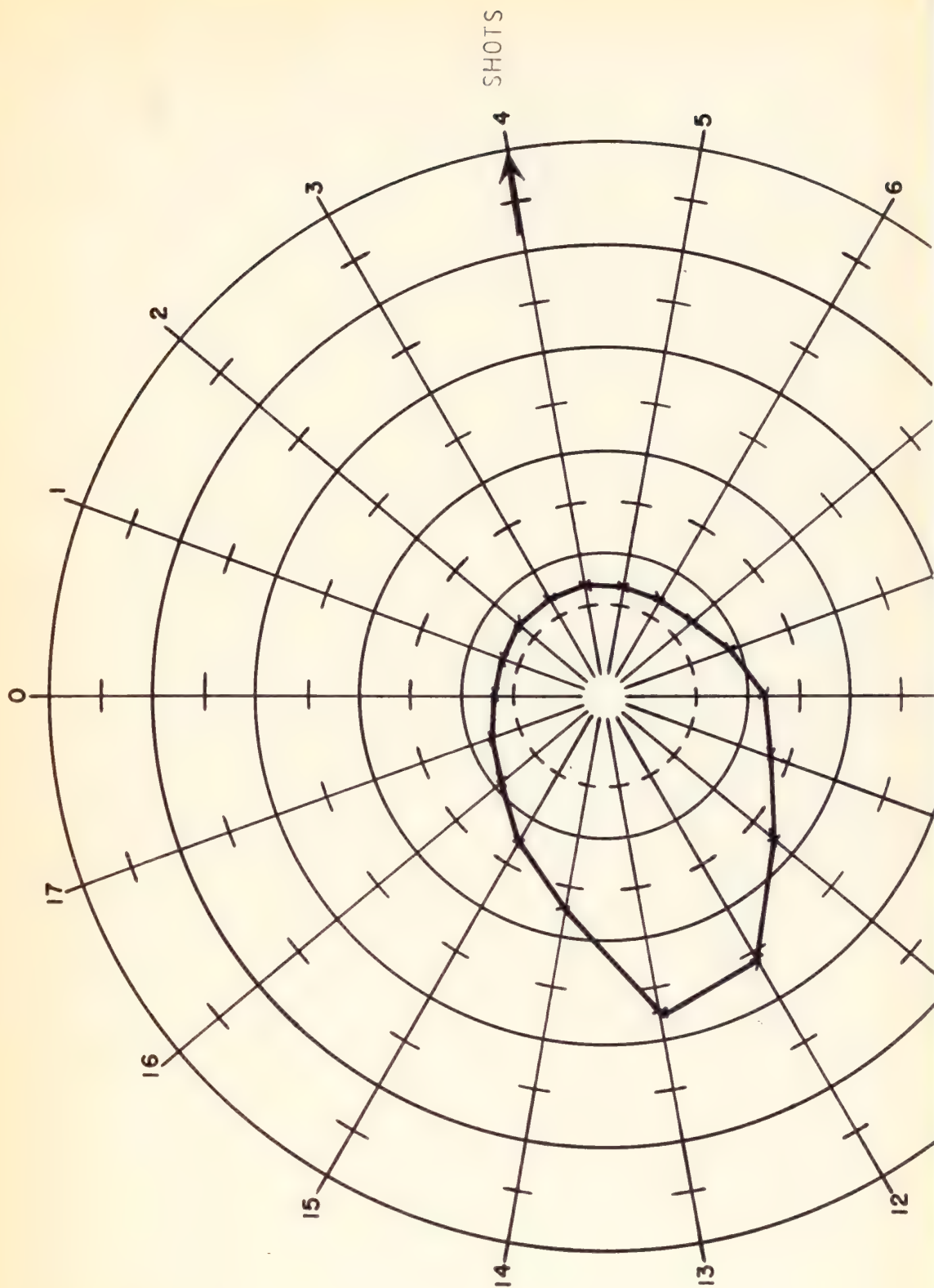
This chart, compilation and/or interpretation of our readings from our gamma gamma instrument and its testing instrument is presented to you in accordance with, but subject to, the terms and conditions of our Service Order for this job. The readings were obtained by readings made in the drill hole and other conditions unknown to us.

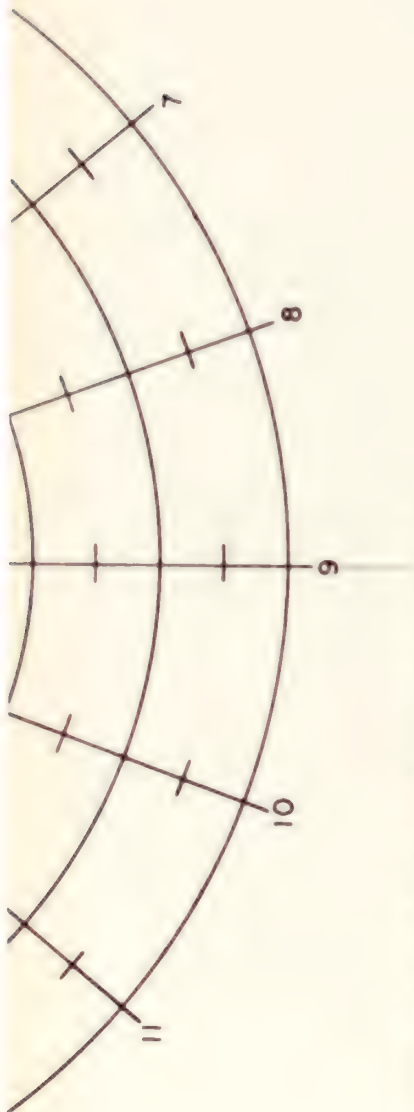
Schlumberger

RADIORIENTATION PLOT POT-B

RADIATION PLOT

NO. 2 MIDDLE SINK PERFORATED 1136 1146 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





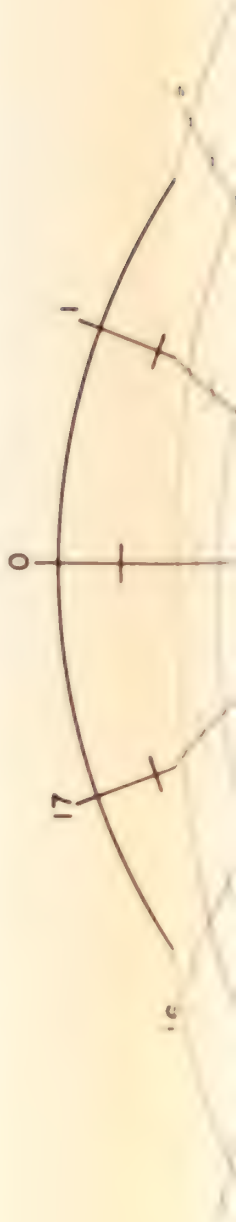
This chart, compilation and/or interpretation of our readings from our gamma-ray instrument used for testing instrument is presented to you in accordance with the subject of the license terms and conditions as we set out on pages 1 and 2 of our current Price Schedule form which are to be set out for the review of our Service Order for this job. The readings must be obtained by computer means in the drill hole and other conditions unknown to us.

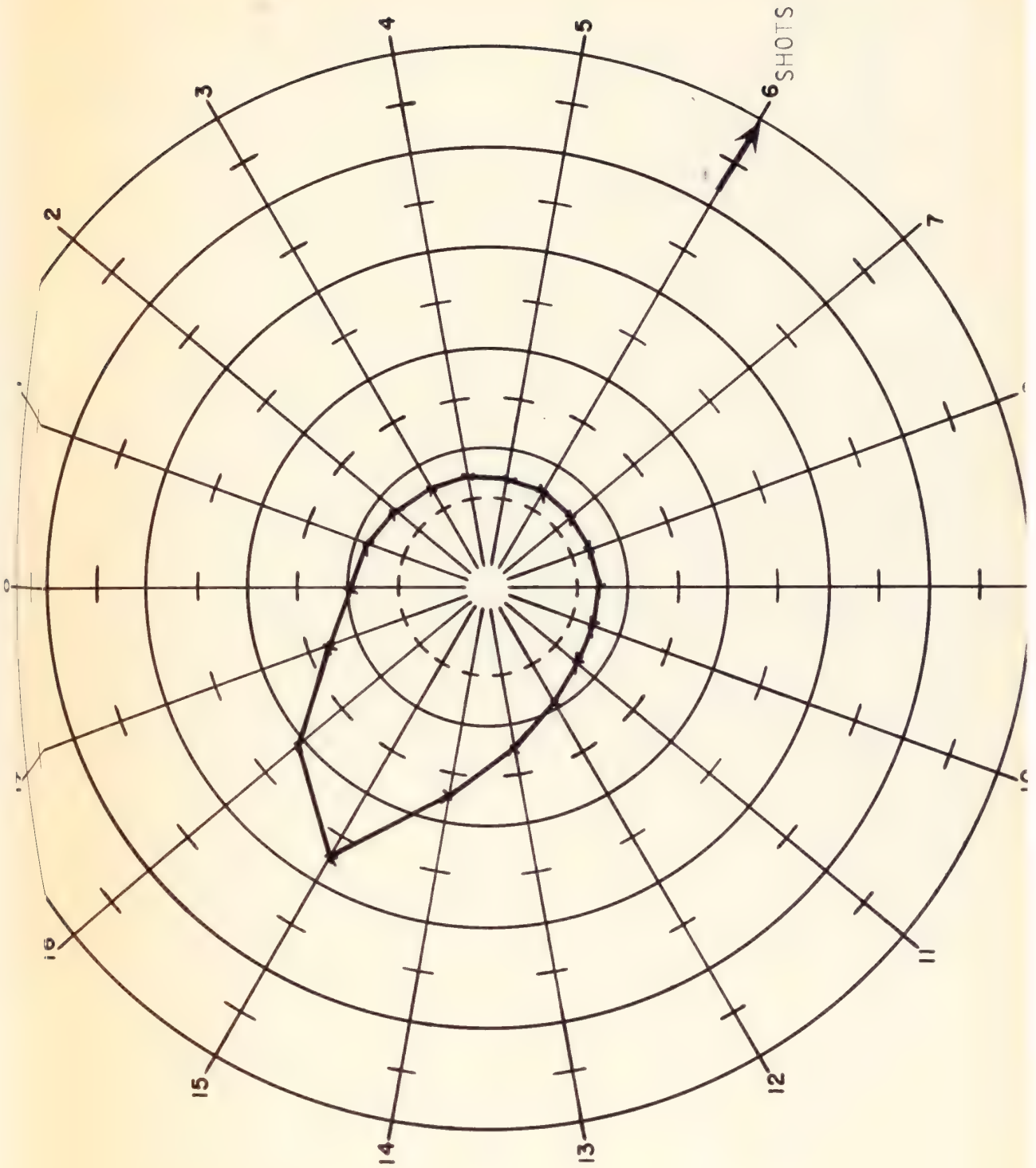
Schlumberger

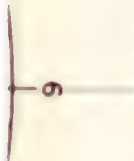
RADIO-ORIENTATION PLOT

POT-B

NO. 2-MIDDLE SINK PERFORATED 1125-1130 ONE SHOT PER FOOT WITH 1 1/2 16" HYPERDOME







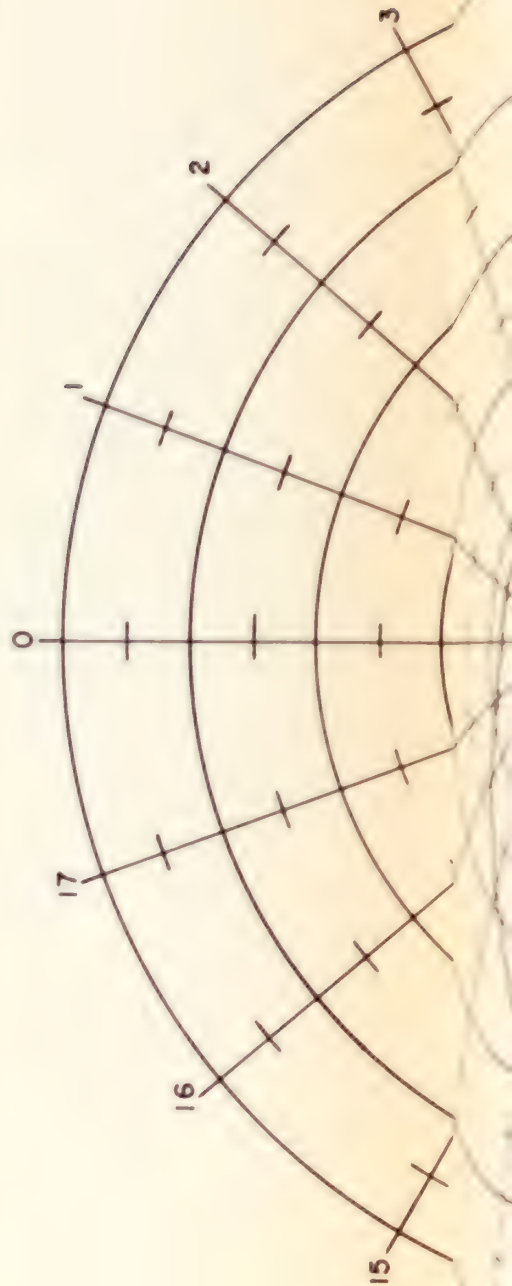
This chart, computation and/or interpretation of our readings from our gamma-gamma instrument and detecting instrument is presented to you in accordance with but subject to the terms and conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by variations in the drill hole and other conditions unknown to us.

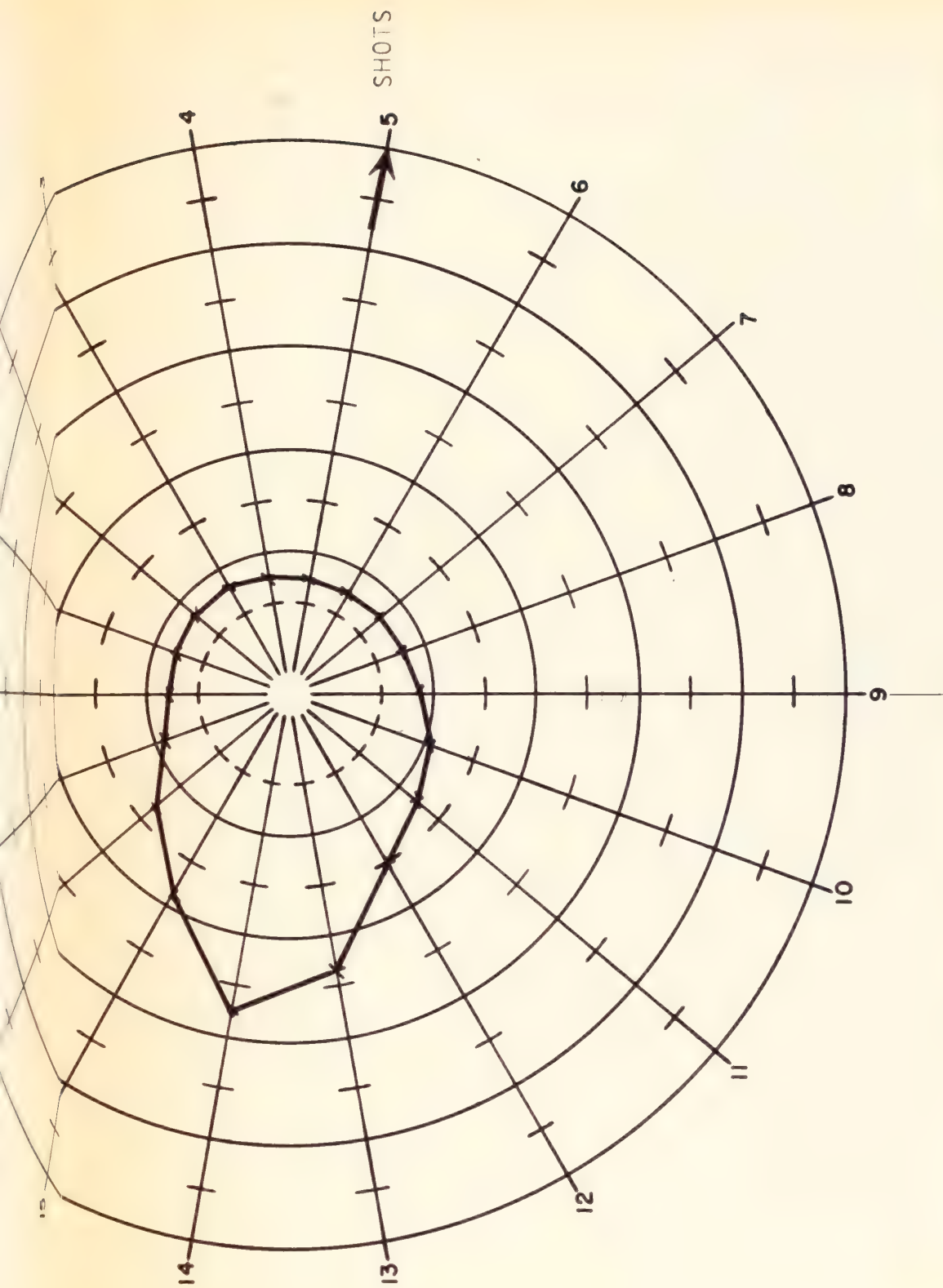
Schlumberger

RADIOORIENTATION PLOT

POT-8

NO. 2 MIDDLE STRING PERFORATED 1114-1124 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



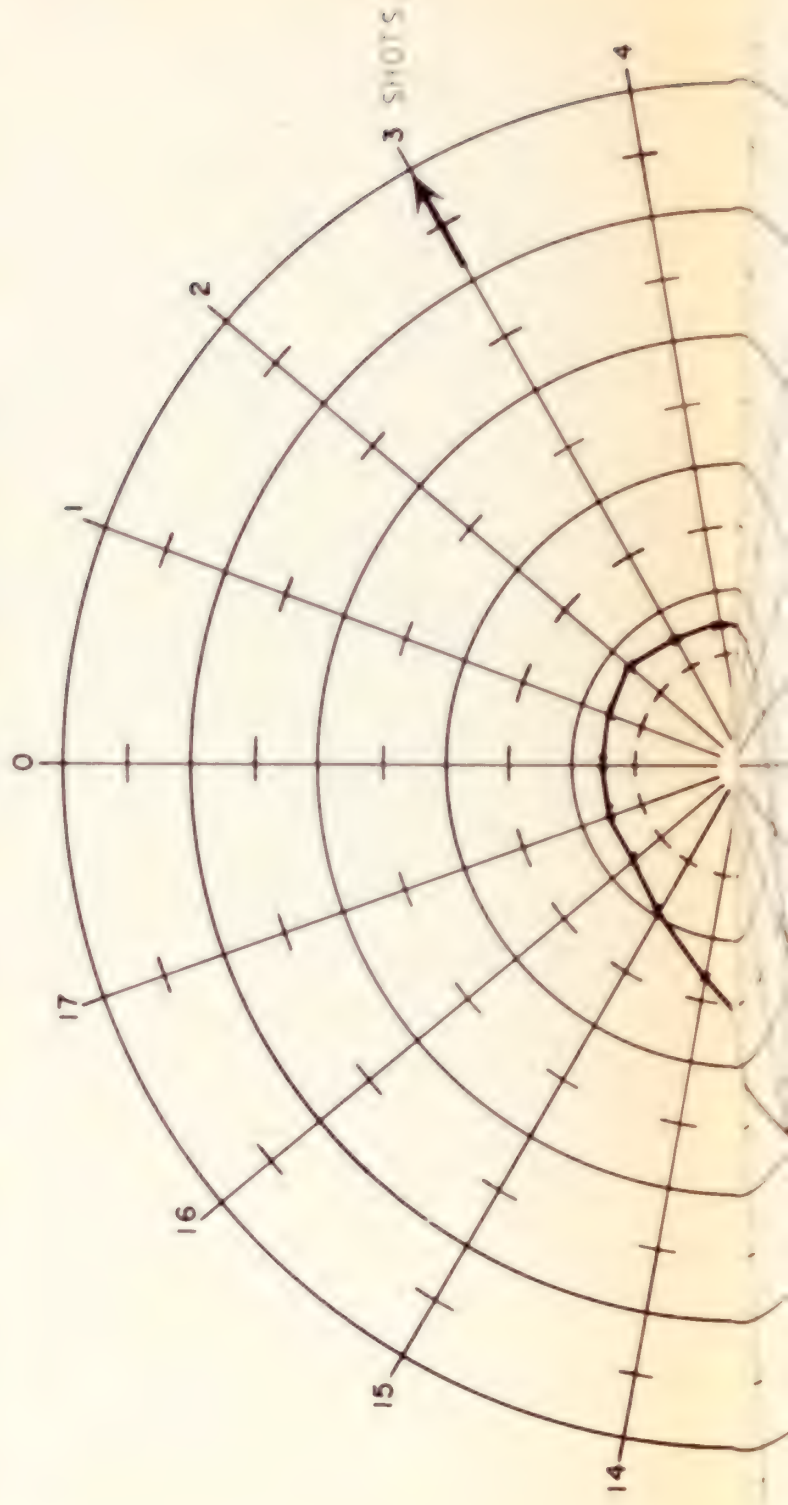


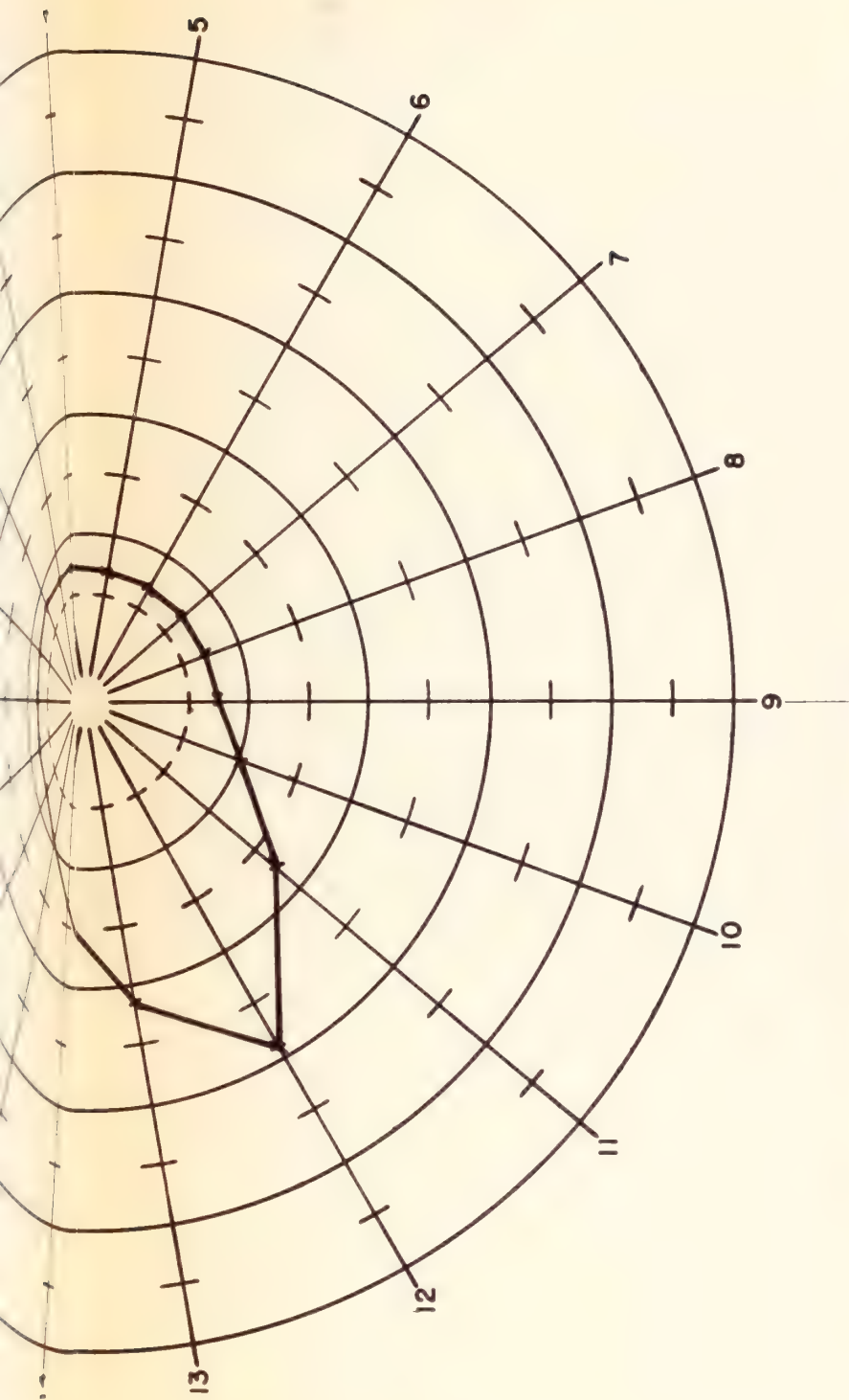
This chart, compilation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B

NO. 2-MIDDLE STRIP PERFORATED 1103-1113 ONE SHOT PER FOOT WITH 1 11/16" HYPERTON





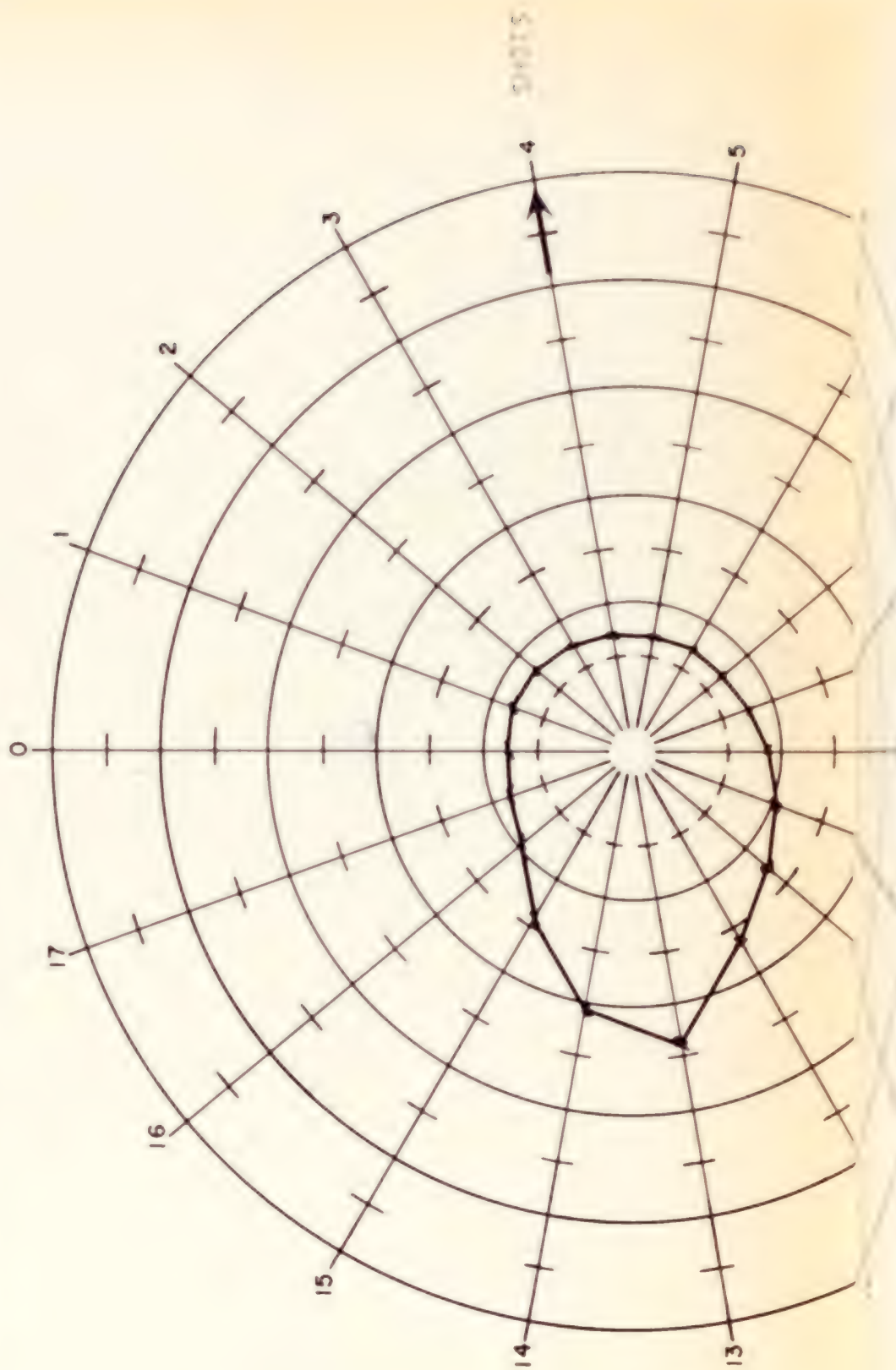
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

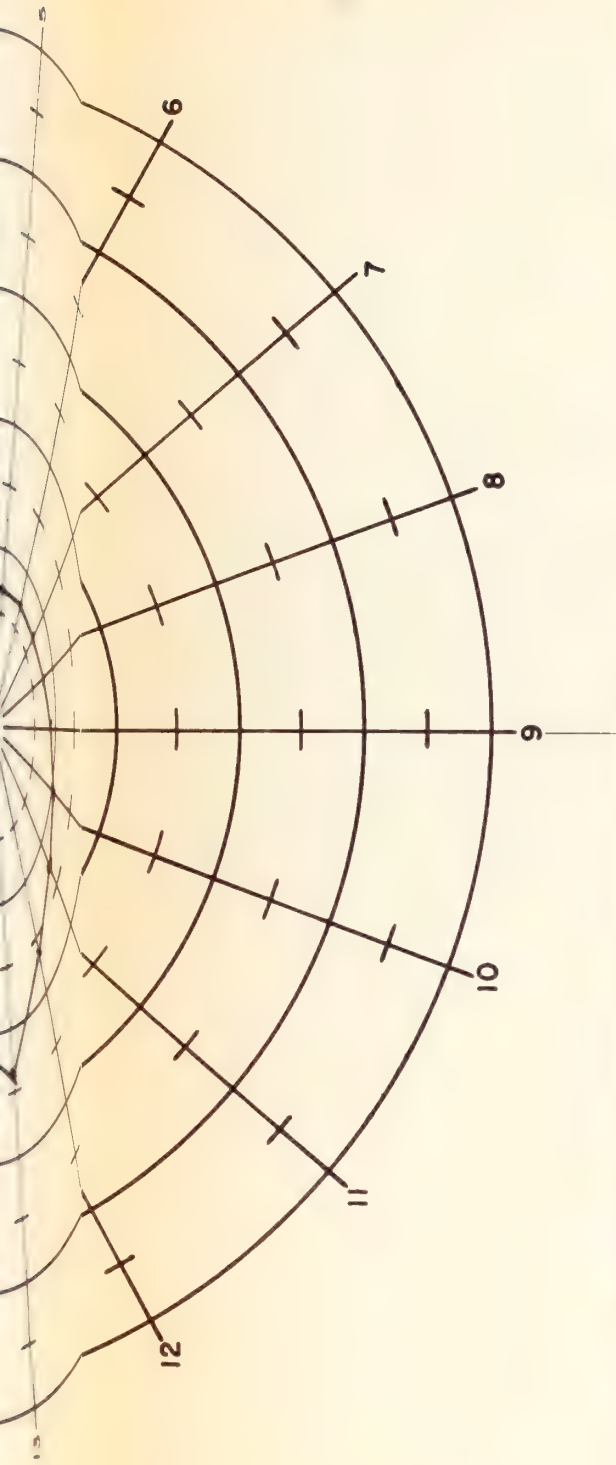
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2-MIDDLE STRING PERFORATED 1094-1102 ONE SHOT PER FOOT WITH 1 IN. 1100 HYPERDOME





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

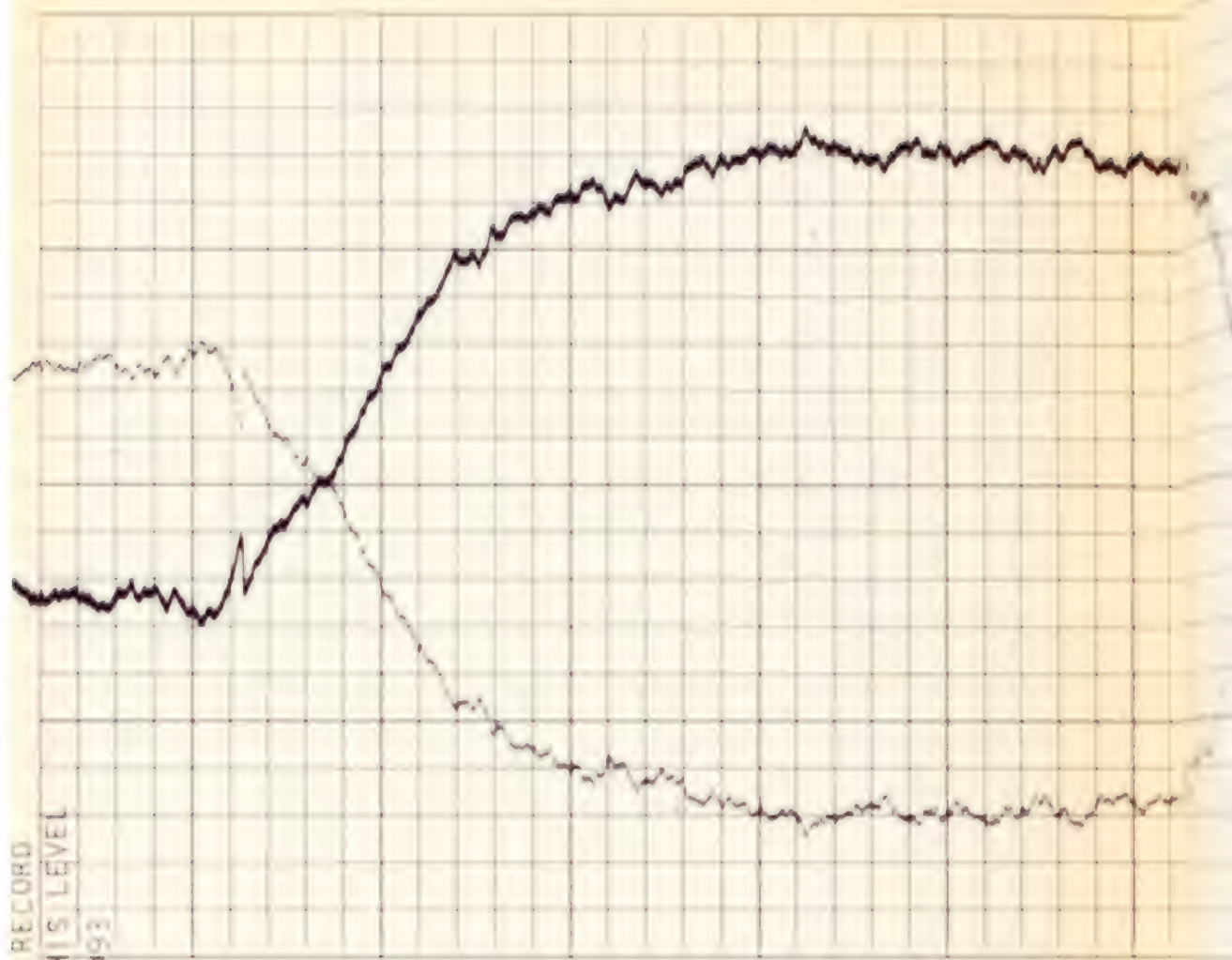
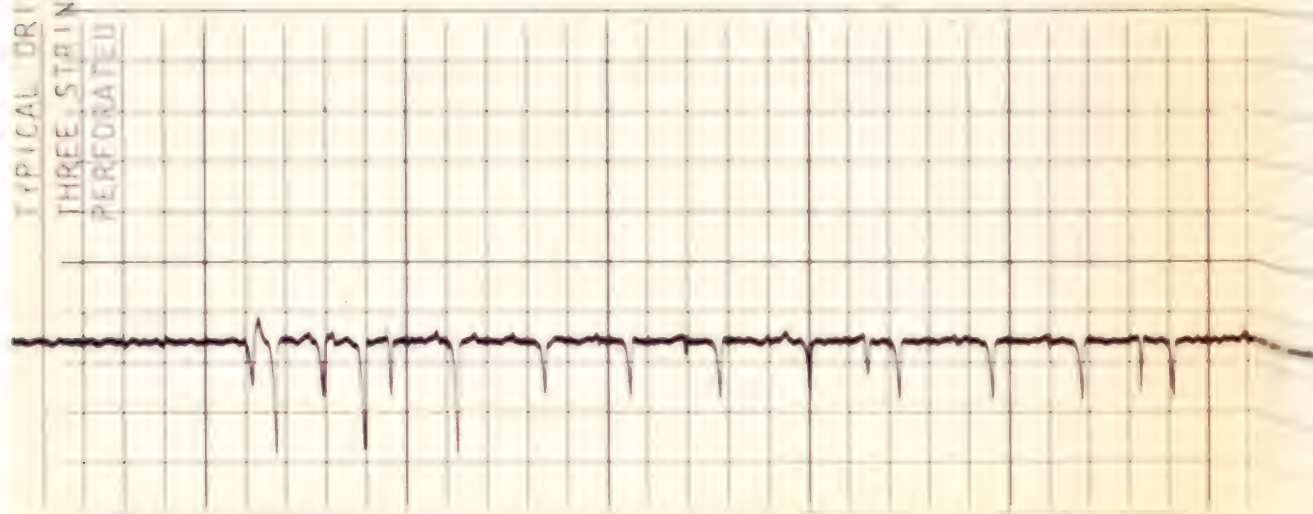


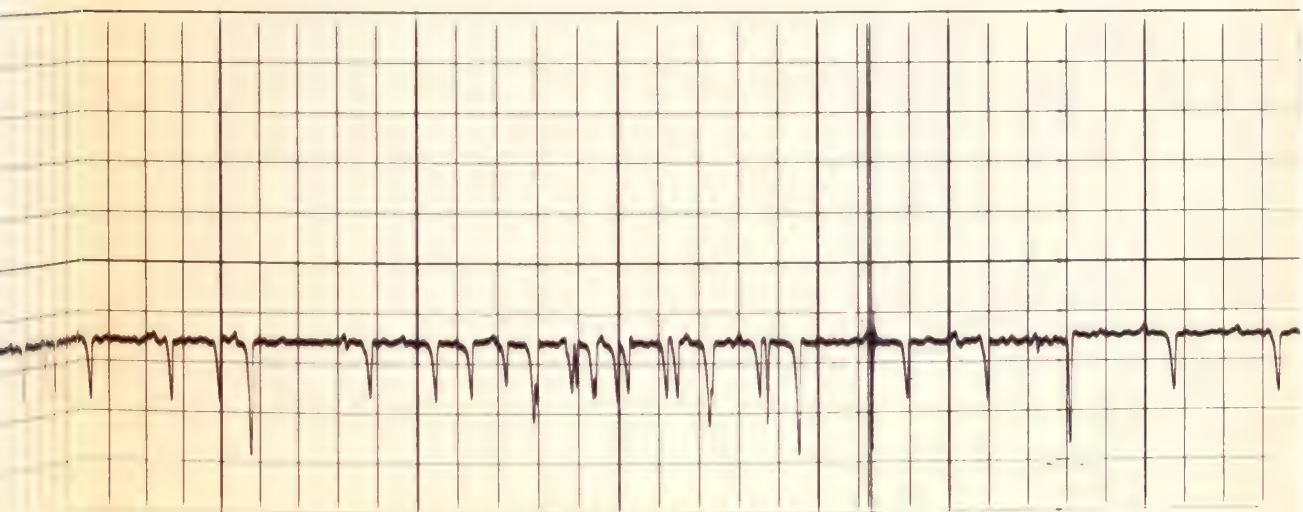
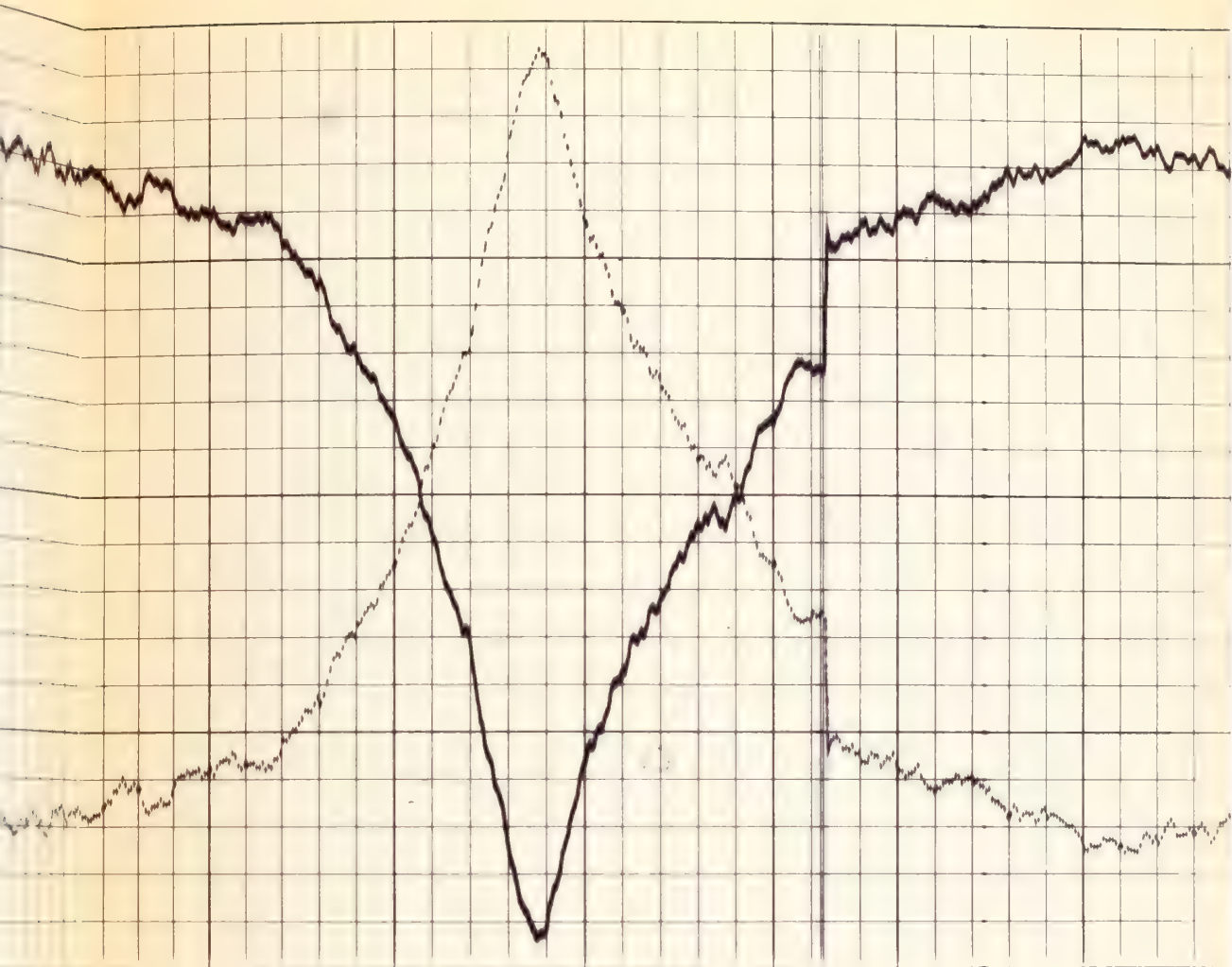
1

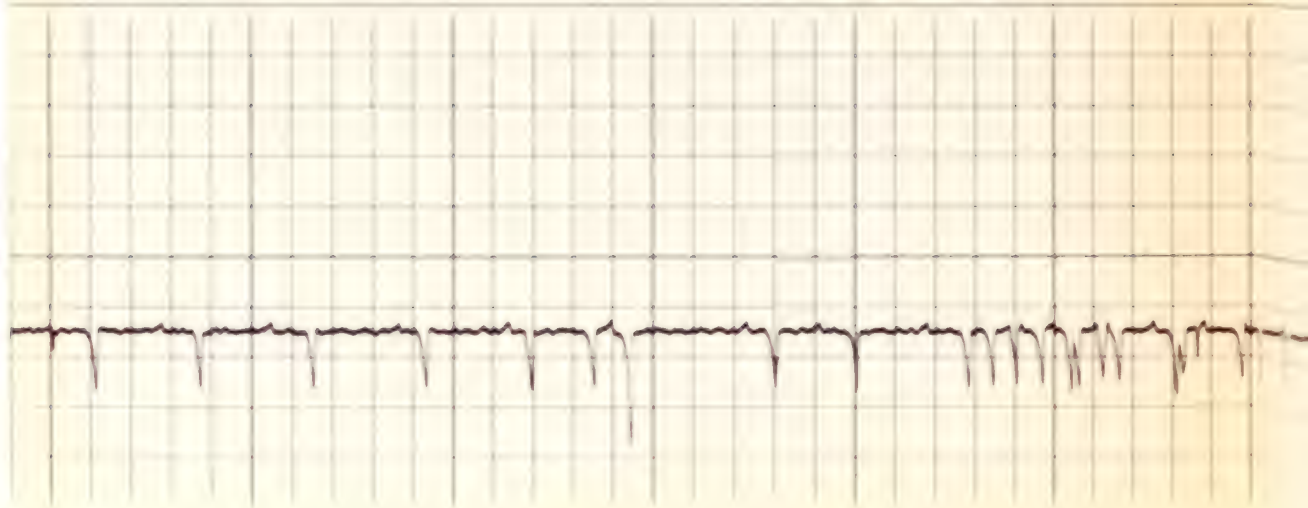
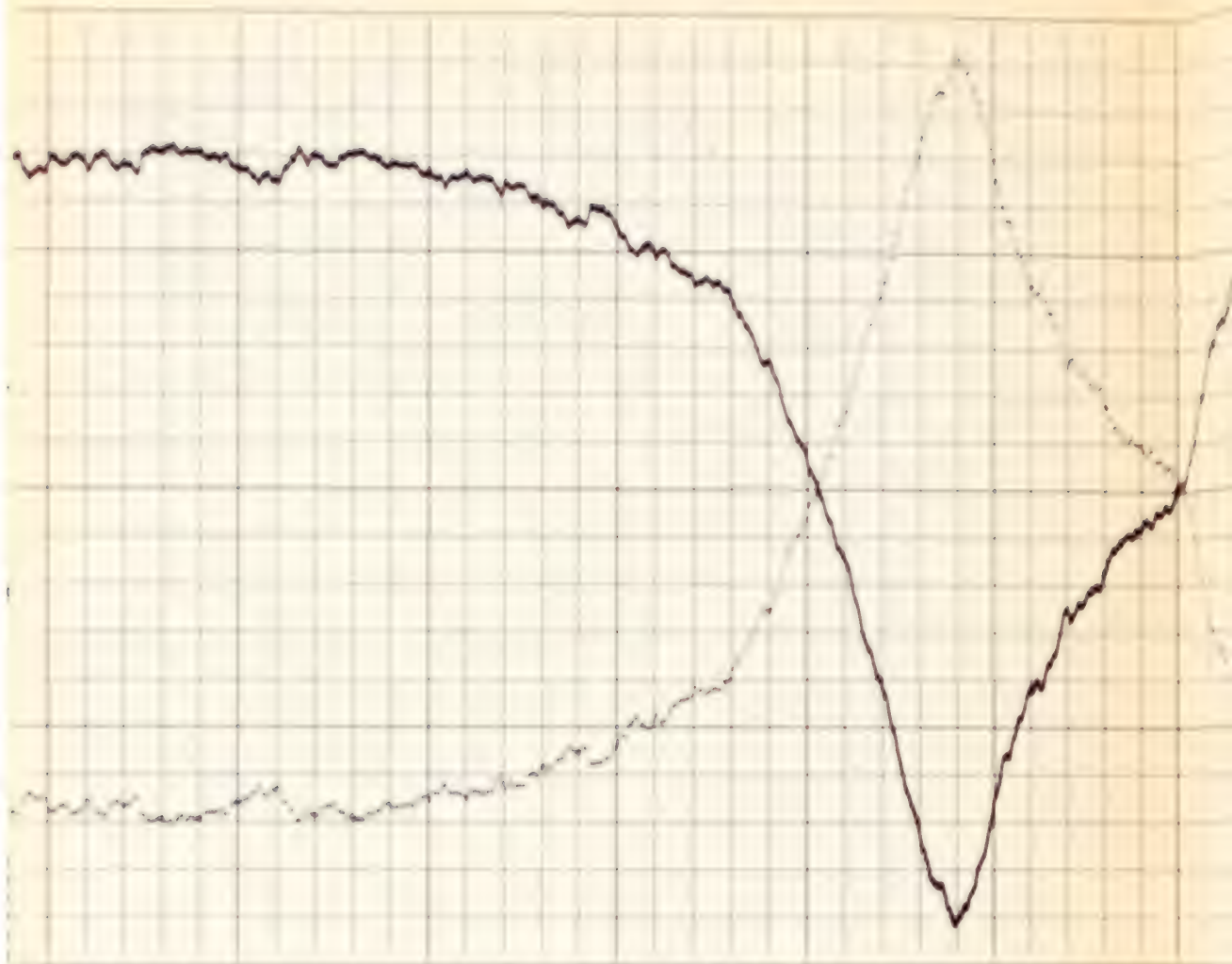
| INDEXING RECORD | | RADIO-ORIENTATION RECORD | |
|--------------------|----|--|-----|
| | | <div> <div> COUNTS INCREASE </div> <div> COUNTS INCREASE </div> </div> | |
| 0 | 2 | 4 | 6 |
| 2 | 4 | 6 | 8 |
| 4 | 6 | 8 | 10 |
| 6 | 8 | 10 | 12 |
| 8 | 10 | 12 | 14 |
| 10 | 12 | 14 | 16 |
| 12 | 14 | 16 | 18 |
| 14 | 16 | 18 | 20 |
| 16 | 18 | 20 | 22 |
| 18 | 20 | 22 | 24 |
| 20 | 22 | 24 | 26 |
| 22 | 24 | 26 | 28 |
| 24 | 26 | 28 | 30 |
| 26 | 28 | 30 | 32 |
| 28 | 30 | 32 | 34 |
| 30 | 32 | 34 | 36 |
| 32 | 34 | 36 | 38 |
| 34 | 36 | 38 | 40 |
| 36 | 38 | 40 | 42 |
| 38 | 40 | 42 | 44 |
| 40 | 42 | 44 | 46 |
| 42 | 44 | 46 | 48 |
| 44 | 46 | 48 | 50 |
| 46 | 48 | 50 | 52 |
| 48 | 50 | 52 | 54 |
| 50 | 52 | 54 | 56 |
| 52 | 54 | 56 | 58 |
| 54 | 56 | 58 | 60 |
| 56 | 58 | 60 | 62 |
| 58 | 60 | 62 | 64 |
| 60 | 62 | 64 | 66 |
| 62 | 64 | 66 | 68 |
| 64 | 66 | 68 | 70 |
| 66 | 68 | 70 | 72 |
| 68 | 70 | 72 | 74 |
| 70 | 72 | 74 | 76 |
| 72 | 74 | 76 | 78 |
| 74 | 76 | 78 | 80 |
| 76 | 78 | 80 | 82 |
| 78 | 80 | 82 | 84 |
| 80 | 82 | 84 | 86 |
| 82 | 84 | 86 | 88 |
| 84 | 86 | 88 | 90 |
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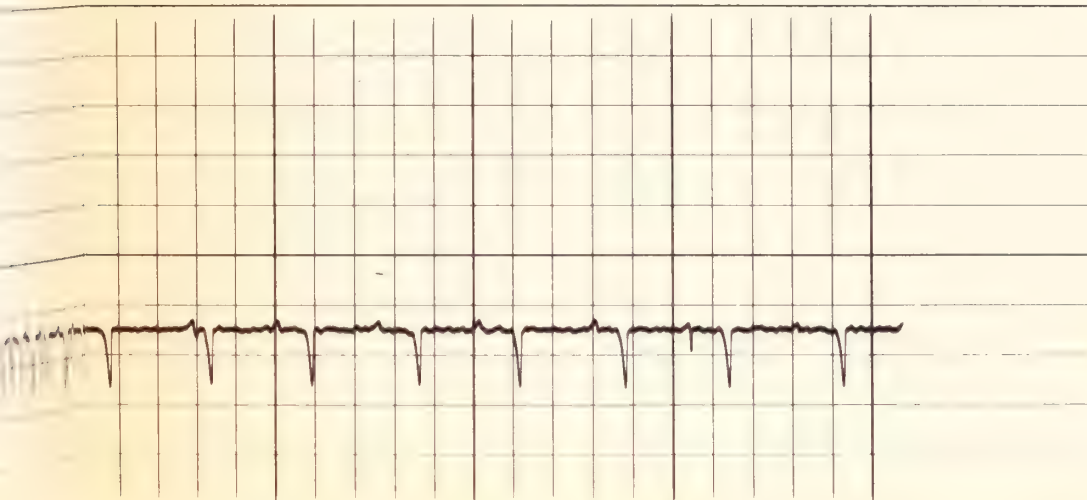
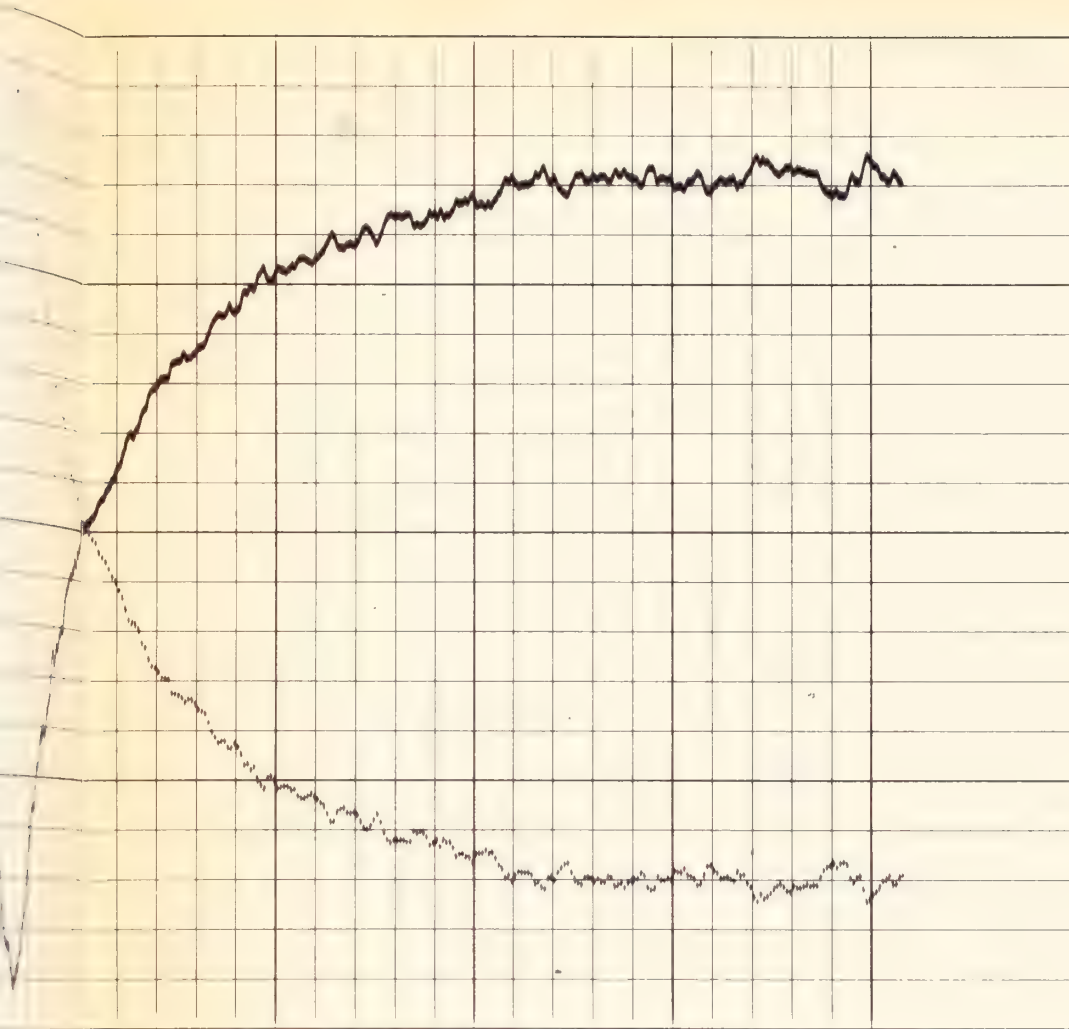
NO. 2-MIDDLE STRING

TYPICAL ORIENTING RECORD
THREE STRINGS AT THIS LEVEL
PERFORATED 1085-1093





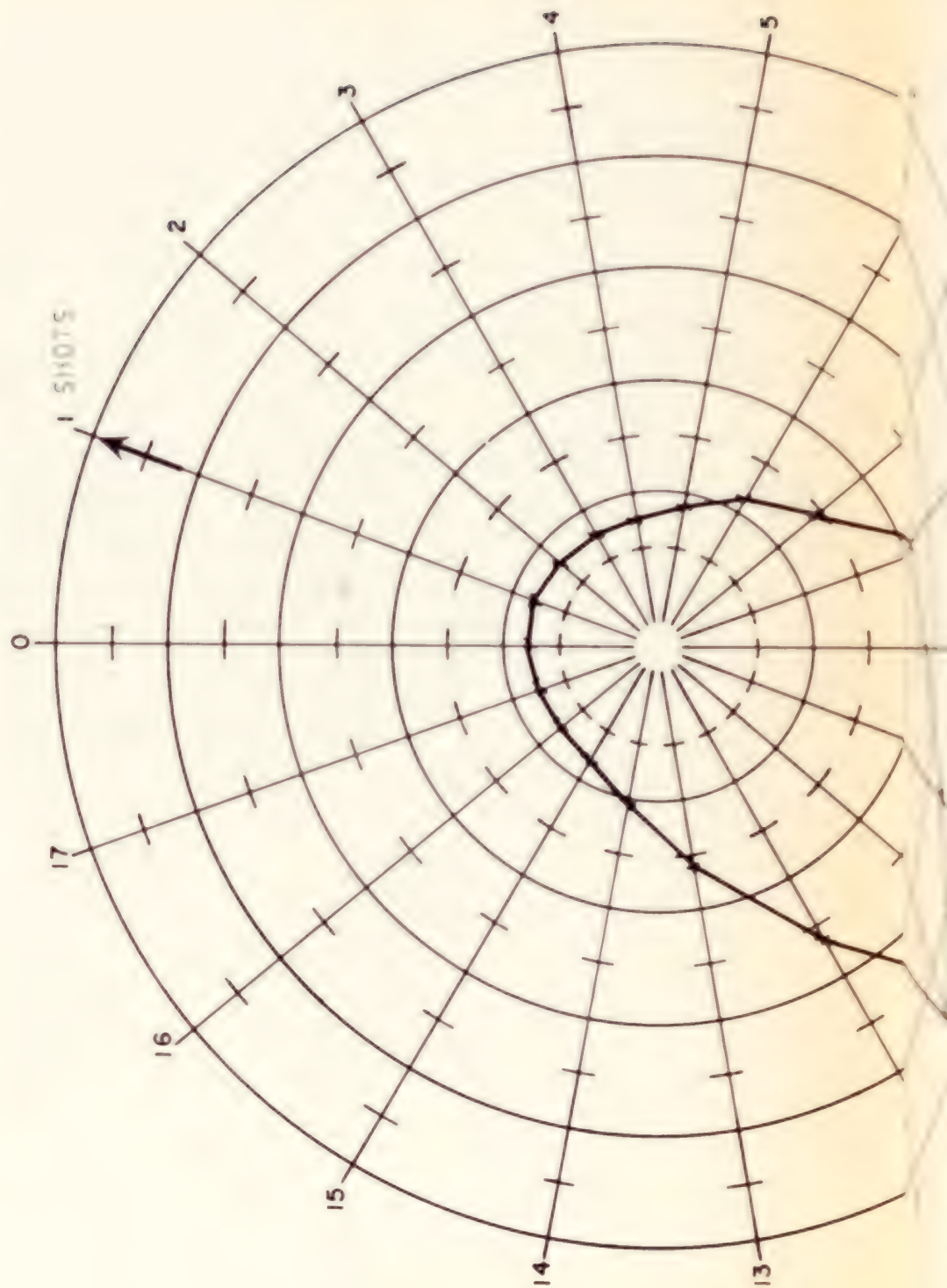


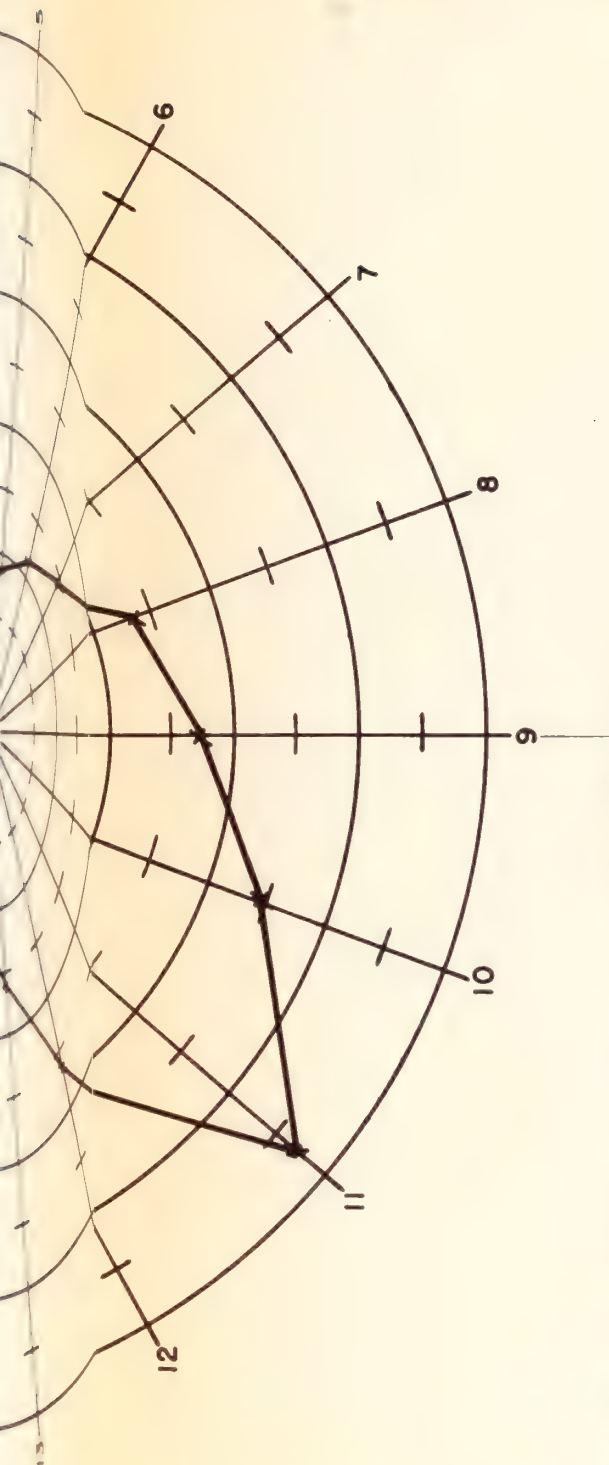


RADIOORIENTATION PLOT

POT-B

NO. 2-MIDDLE STRING PERFORATED 1381-1393 ONE SHOT PER FOOT WITH 1 1/2" 16" HYPERDOME





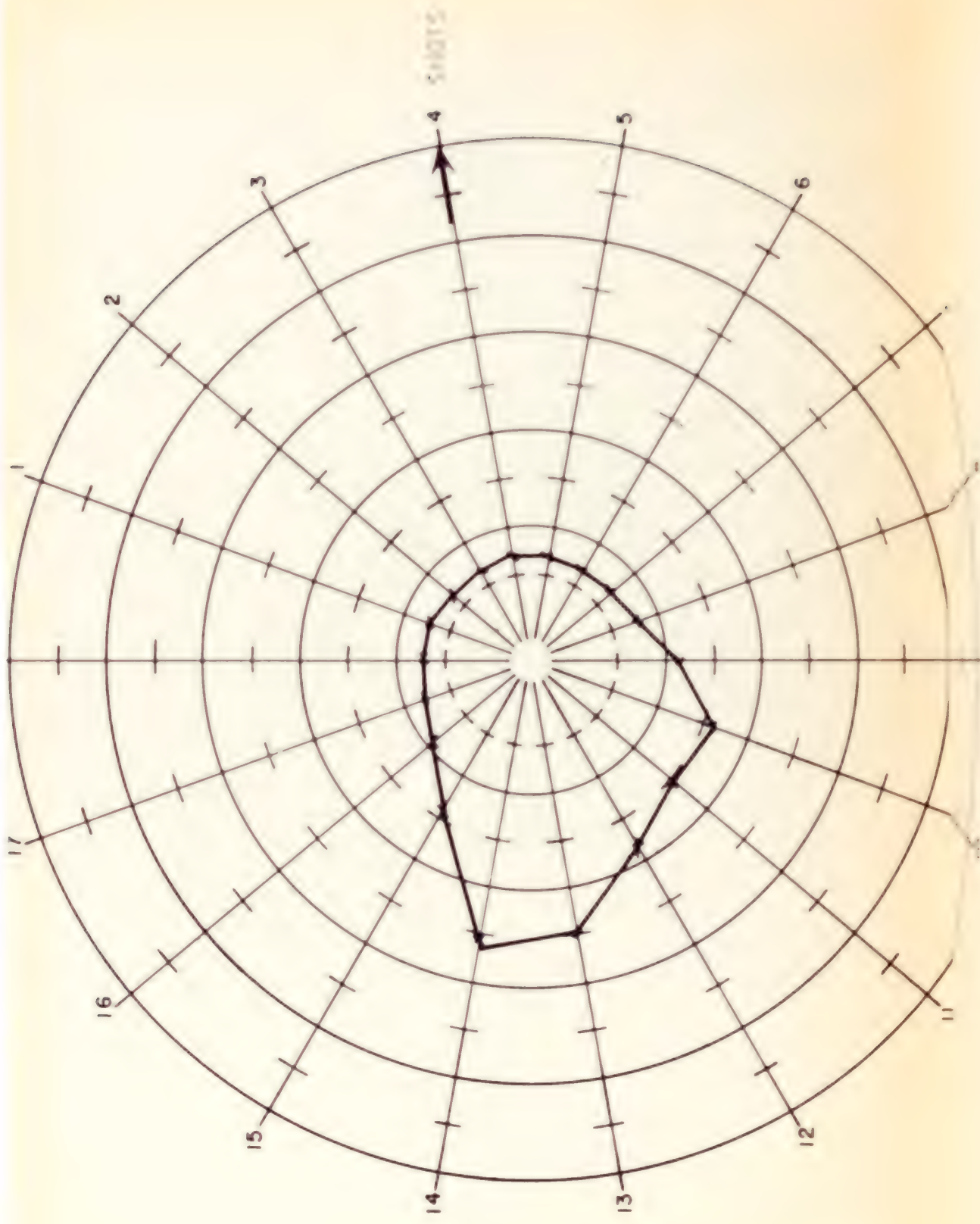
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

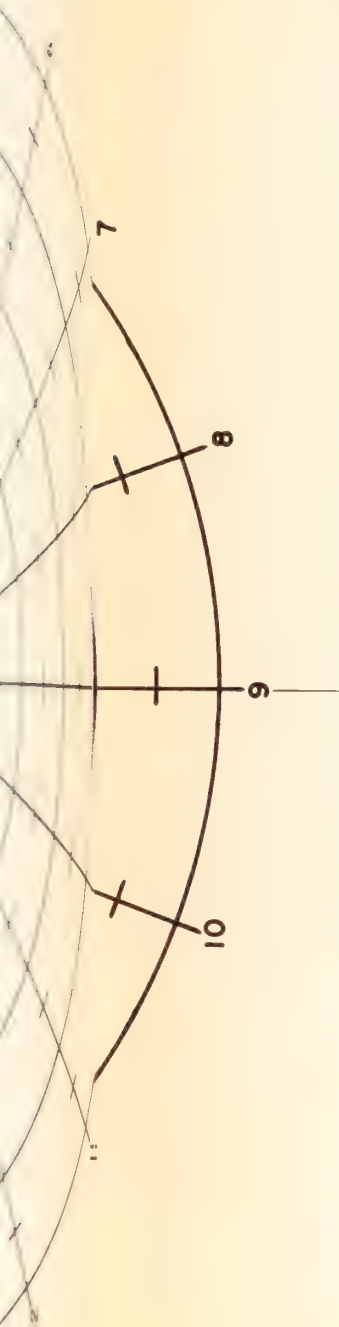


RADIO-ORIENTATION PLOT

POT-B

NO. 2--MIDDLE STRING PERFORATED 1172-1182 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





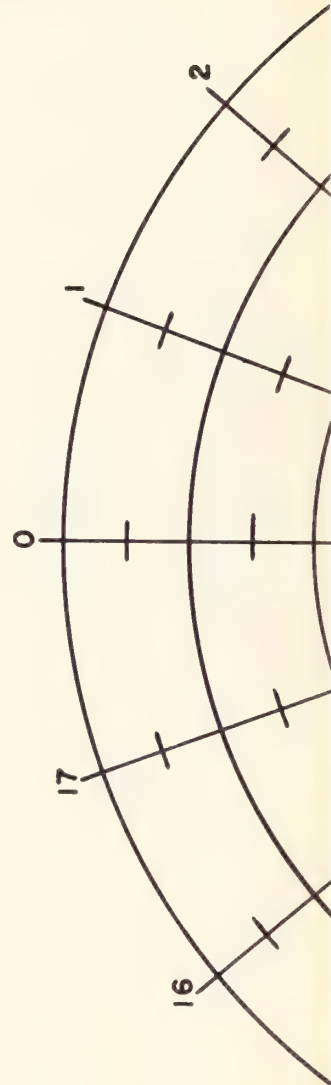
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

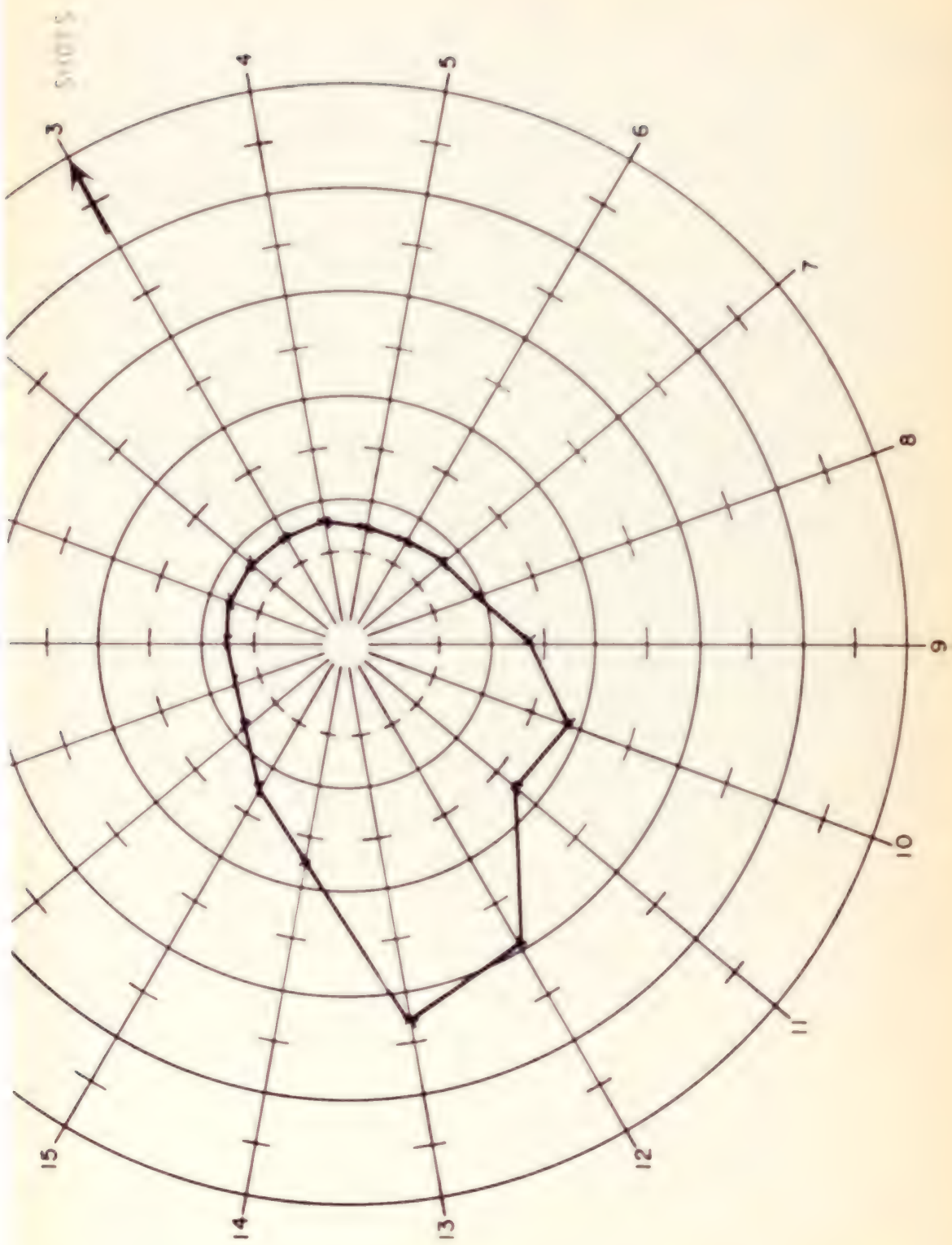
Schlumberger

RADIOORIENTATION PLOT

POT-B

NO. 2--MIDDLE STRING PERFORATED 1161-1171 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





THIS CHART, COMPUTATION AND/OR INTERPRETATION OF OUR READINGS CAN BE OBTAINED FROM OUR SERVICE ORDER AND OUR TESTING INSTRUMENT IS PRESENTED TO YOU IN ACCORDANCE WITH, BUT SUBJECT TO, THE GENERAL TERMS AND CONDITIONS AS SET OUT ON PAGES 1 AND 2 OF OUR CURRENT PRICE SCHEDULE AND WHICH ARE AS SET OUT ON THE REVERSE SIDE OF OUR SERVICE ORDER FOR THIS JOB. THE READINGS COULD BE ADVERSELY AFFECTED BY VAGRANT METAL IN THE DRILL HOLE AND OTHER CONDITIONS UNKNOWN TO US.

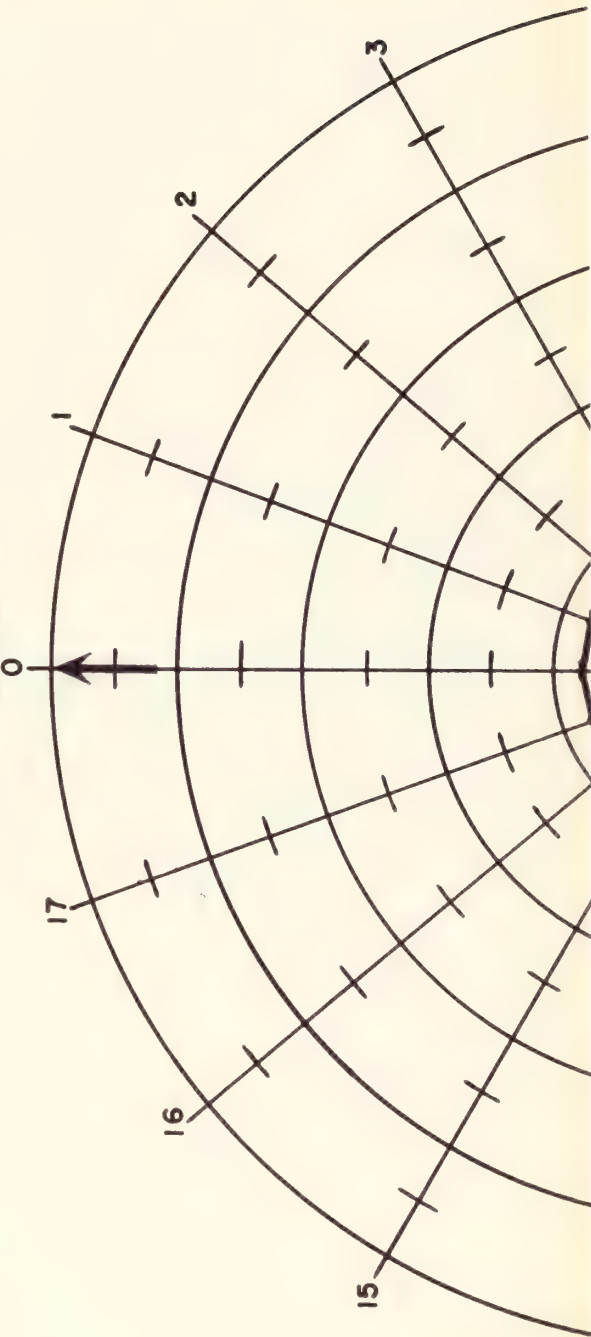
Schlumberger

RADIO-ORIENTATION PLOT

POT-B

NO. 2-MIDDLE STRING PERFORATED 1050-1060 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

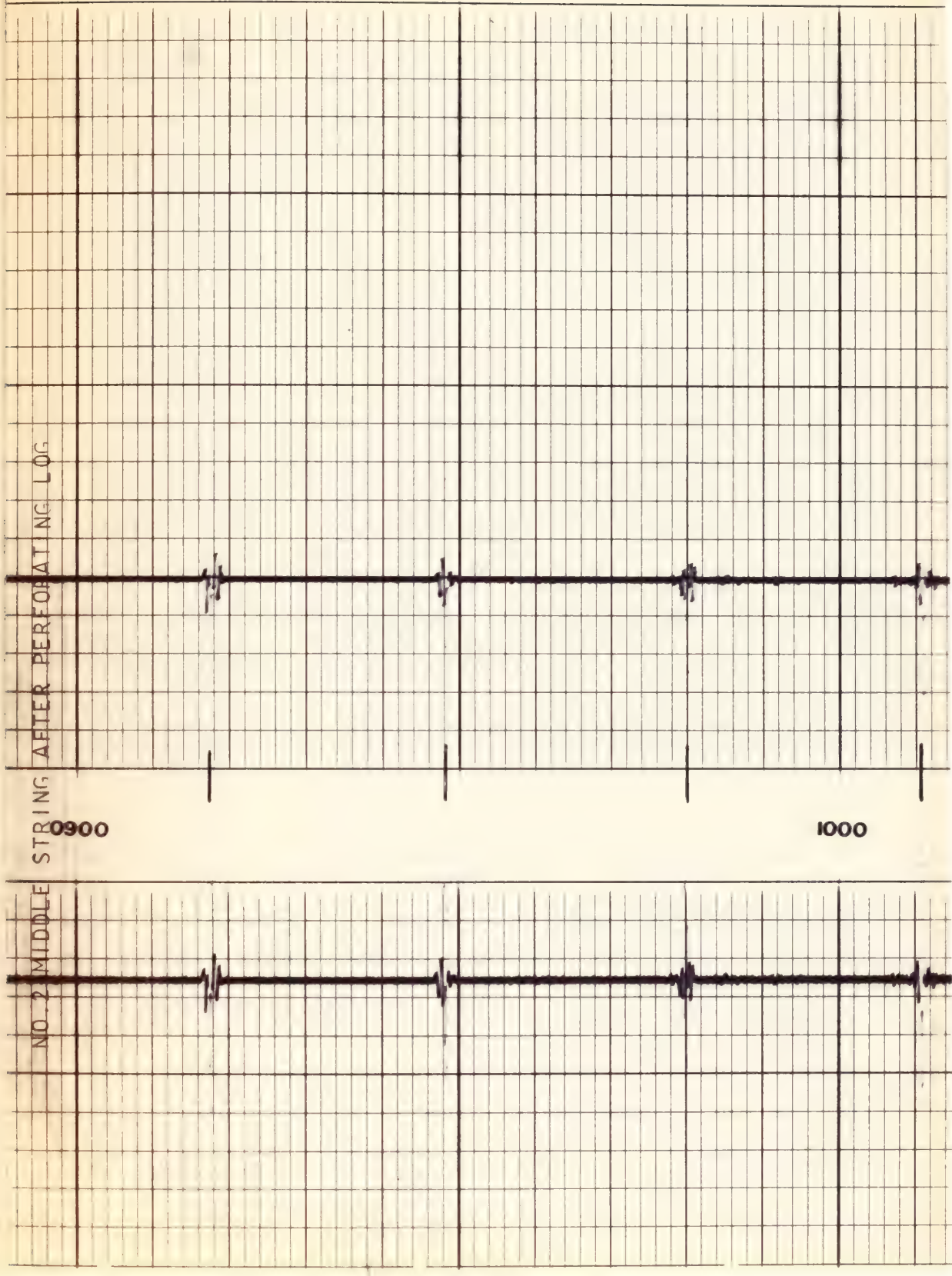
SHOTS

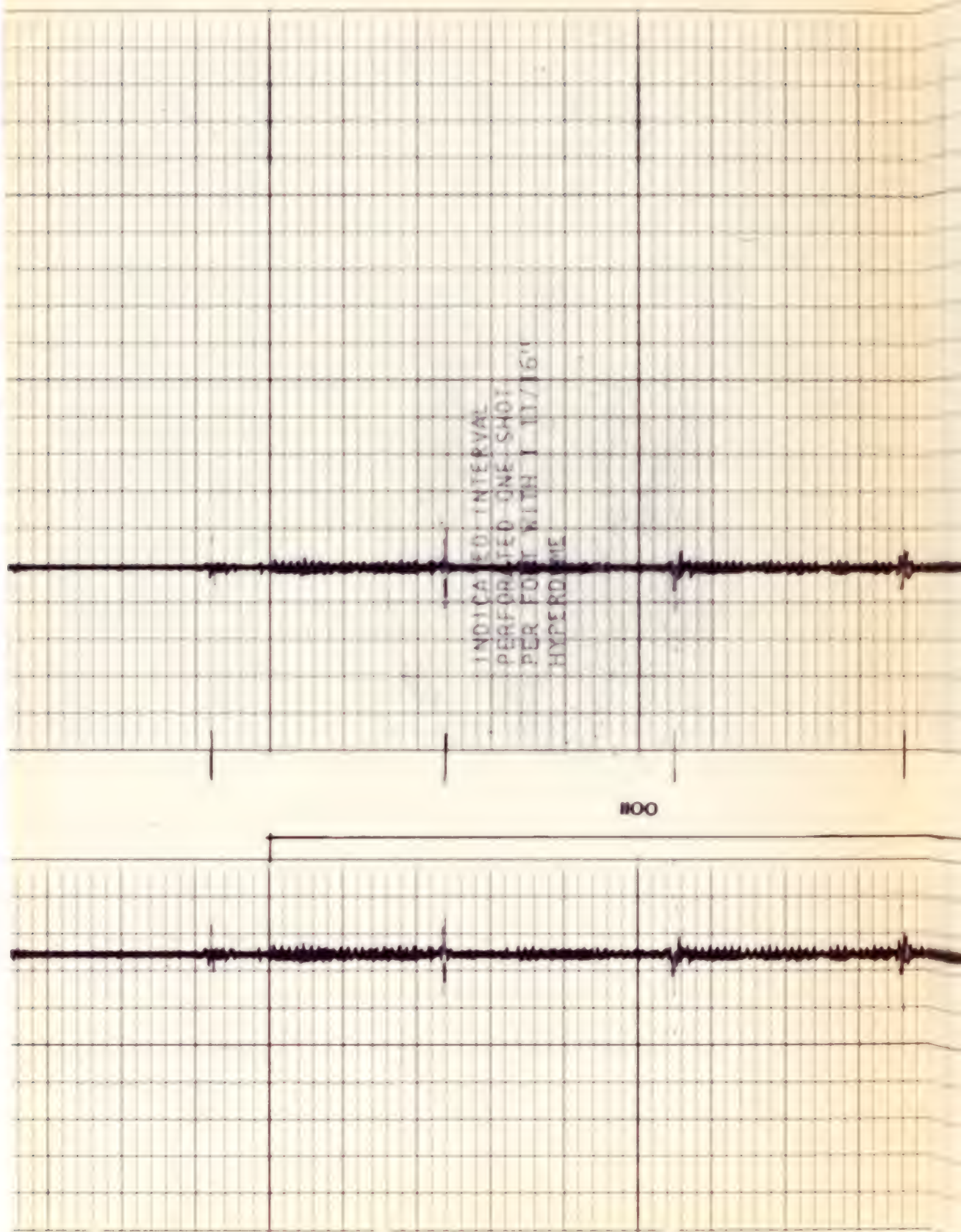


NO. 2 MIDDLE STRING AFTER PERFORATING LOG

0900

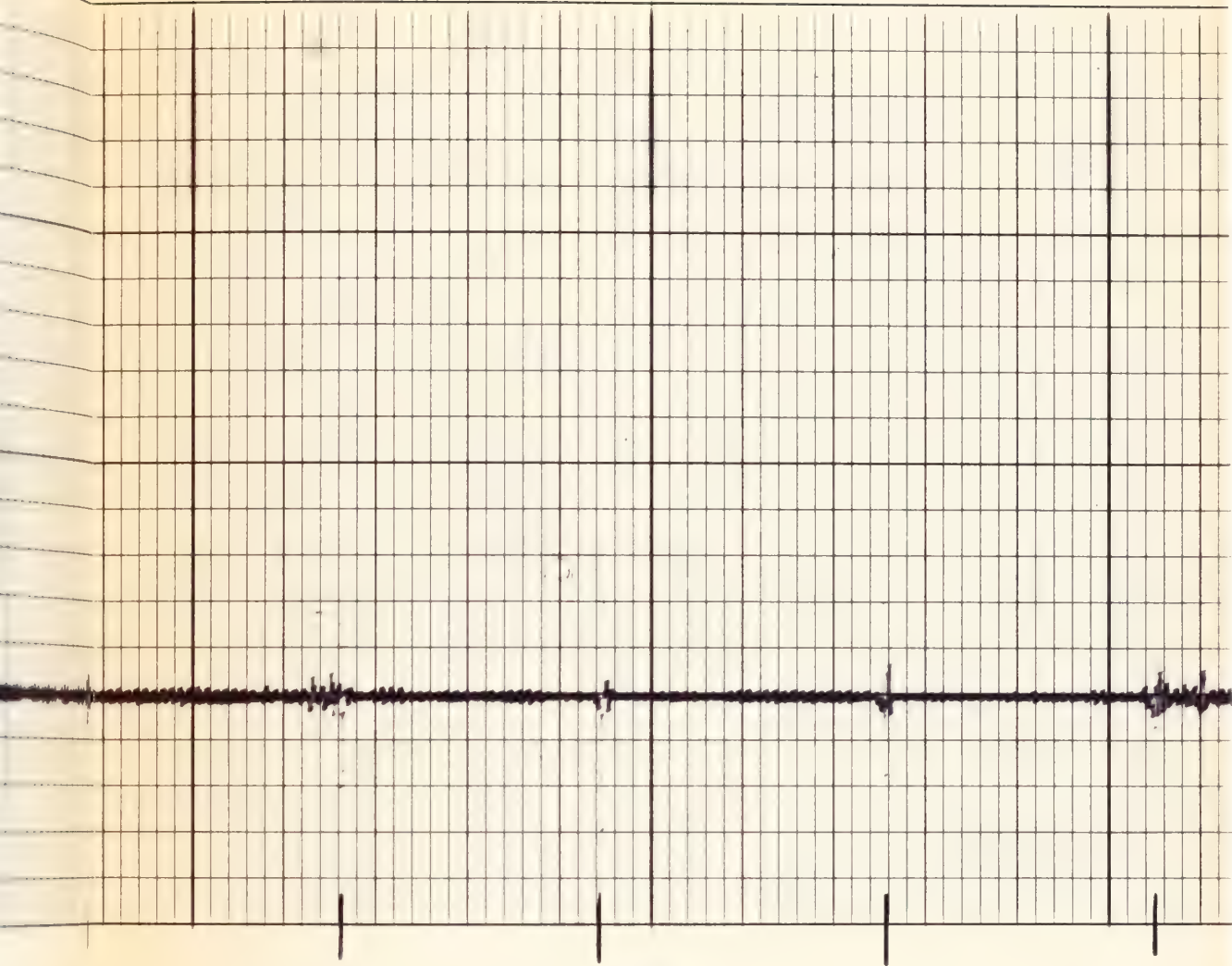
1000



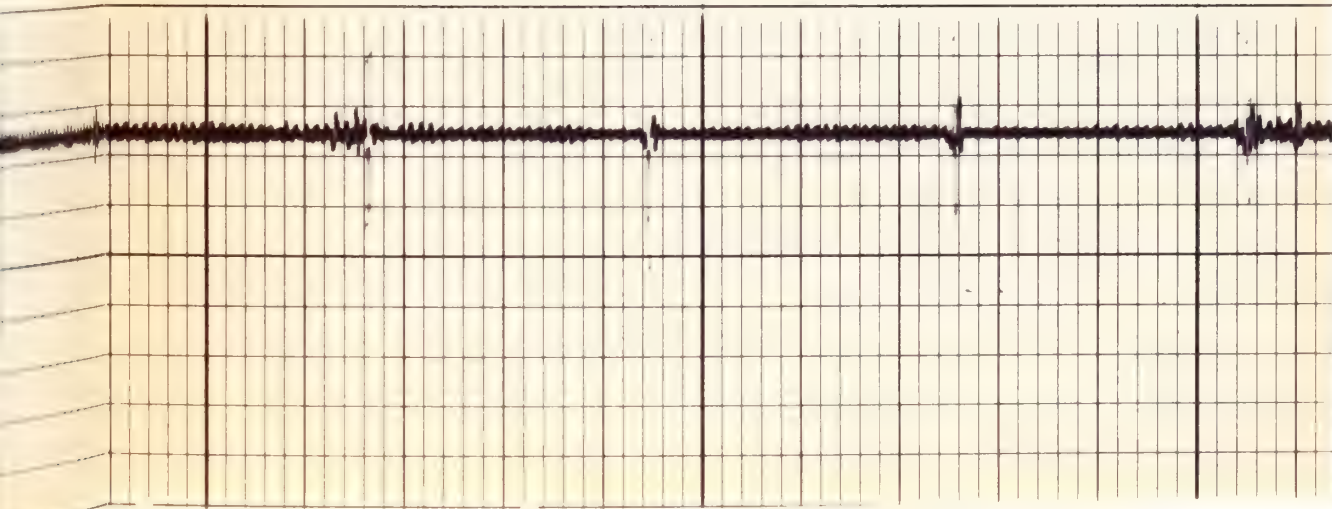


INDICATED INTERVAL
PERFORMED ONE SHOT
PER FOOT WITH 1 11/16"
HYPERDOLME

1100



1200



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

Schlumberger

CEMENT BOND LOG

GR-VDL-CCI

| | | | | | | | |
|--|--|------------|----------------------|------------------|----------------------------------|---|--|
| COUNTY <u>RIO BLANCO</u> Field or LOCATION <u>SORGHUM GULCH</u> WELL <u>AT-1D</u> COMPANY <u>ATLANTIC RICHFIELD</u> | COMPANY <u>ATLANTIC RICHFIELD, ET AL</u> | | | | | | |
| | WELL <u>AT-1D</u> | | | | | | |
| | FIELD <u>SORGHUM GULCH</u> | | | | | | |
| | COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> | | | | | | |
| LOCATION <u>API Serial No. 1515' FWL & 1511' FSL</u> Sec. <u>7</u> Twp. <u>3S</u> Rge. <u>9CW</u> | | | | | Other Services: <u>ORP-HD</u> | | |
| Permanent Datum: <u>GL</u> , Elev. <u>6903</u> Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum Drilling Measured From <u>GL</u> | | | | | | Elev.: K.B. <u>----</u> D.F. <u>----</u> G.L. <u>6903</u> | |
| Date | | 9-12-74 | | Type Drill Fluid | | AIR MIST | |
| Run No. | | ONE | | Fluid Level | | FULL | |
| Depth — Driller | | 1640-1441 | | Max. Rec. Temp. | | - °F | |
| Depth — Logger | | 1630-1438 | | Est. Cement Top | | 795 | |
| Btm. Log Interval | | 1622-1420 | | Equip. Location | | 3552 VERNAL | |
| Top Log Interval | | 695-695 | | Recorded By | | MARTIN-ST. AUGUSTINE | |
| Open Hole Size | | 7-7/8" | | Witnessed By | | MR. ROSS | |
| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom | |
| Surface String | 3 5/8 | | | | SURF | 60 | |
| Prot. String #1 | 2 7/8 | 4.7 | | T-C | SURF | 1640 | |
| Prod. String #2 | 2 7/8 | 4.7 | | T-C | SURF | 1441 | |
| STRING #3 | 2 3/8 | 4.7 | | T-C | SURF | 1079 | |
| PRIMARY CEMENTING DATA | | | | | | | |
| STRING | Surface | Protection | Production | Liner | | | |
| Vol. of cement | | | 150 S.S. | | | | |
| Type of cement | | | HOWCO LT. WT. | | | | |
| Additive | | | 10#/S. - OIL SOLUBLE | | | | |
| Retarder | | | | | | | |
| Wt. of slurry | | | | | | | |
| Water loss | | | | | | | |
| Type fluid in csg. | | | | | | | |
| Fluid wt. | | | | | | | |

TRANSIT TIME

MICROSECONDS _____ SPACING 200

GAMMA RAY API UNITS

CASING BOND MILLIVOLTS

0 100

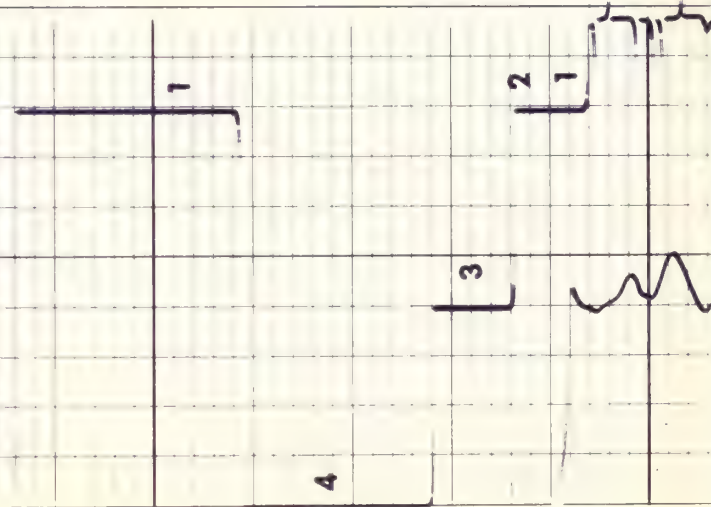
VARIABLE DENSITY

MICROSECONDS _____ SPACING 1200

DEPTH

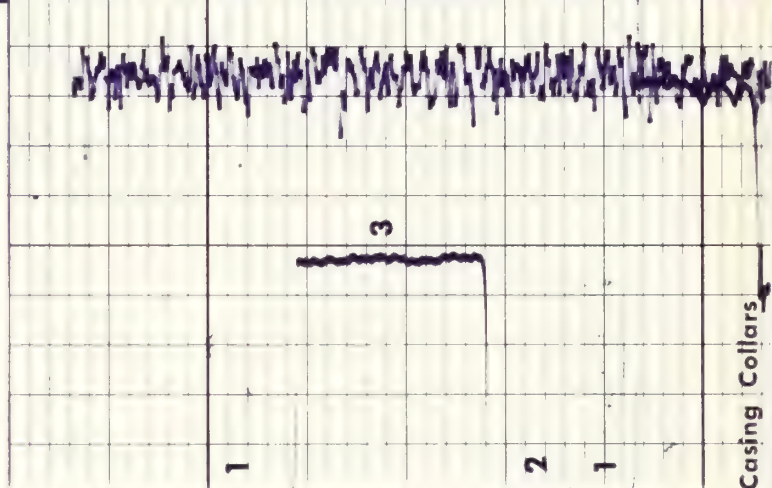
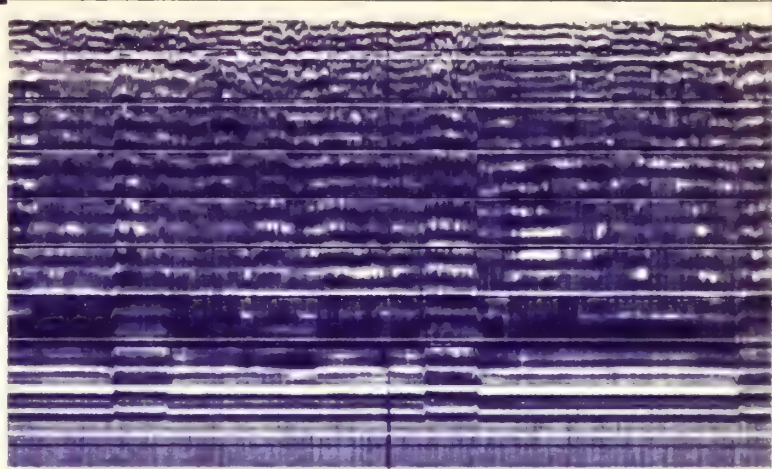
Casing Collars
Corrected Depth

CALIBRATION AFTER SURVEY

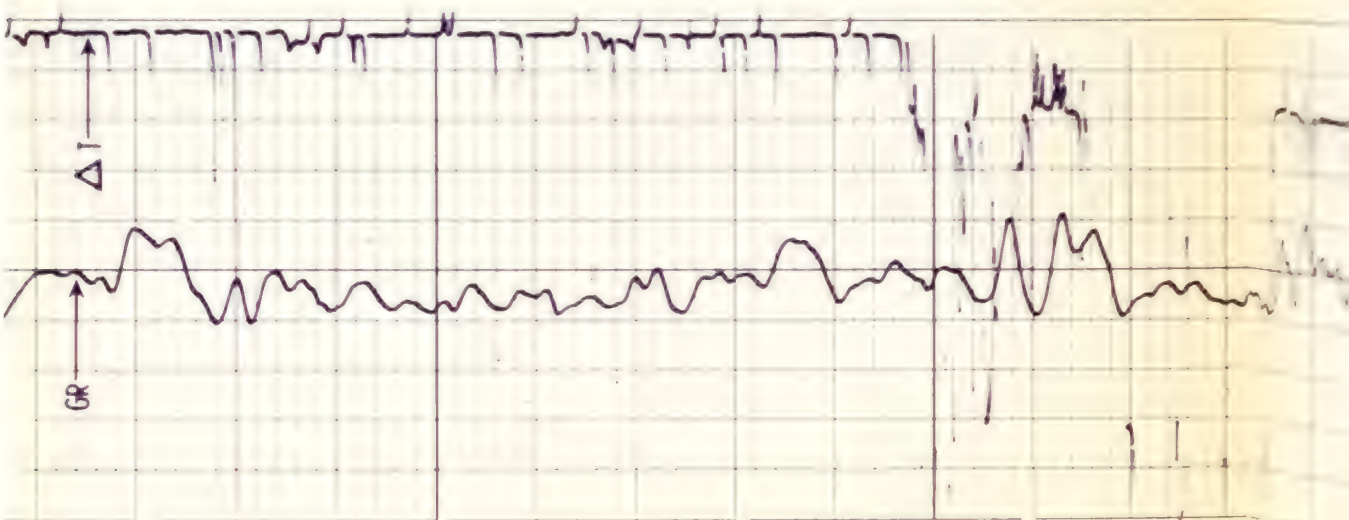
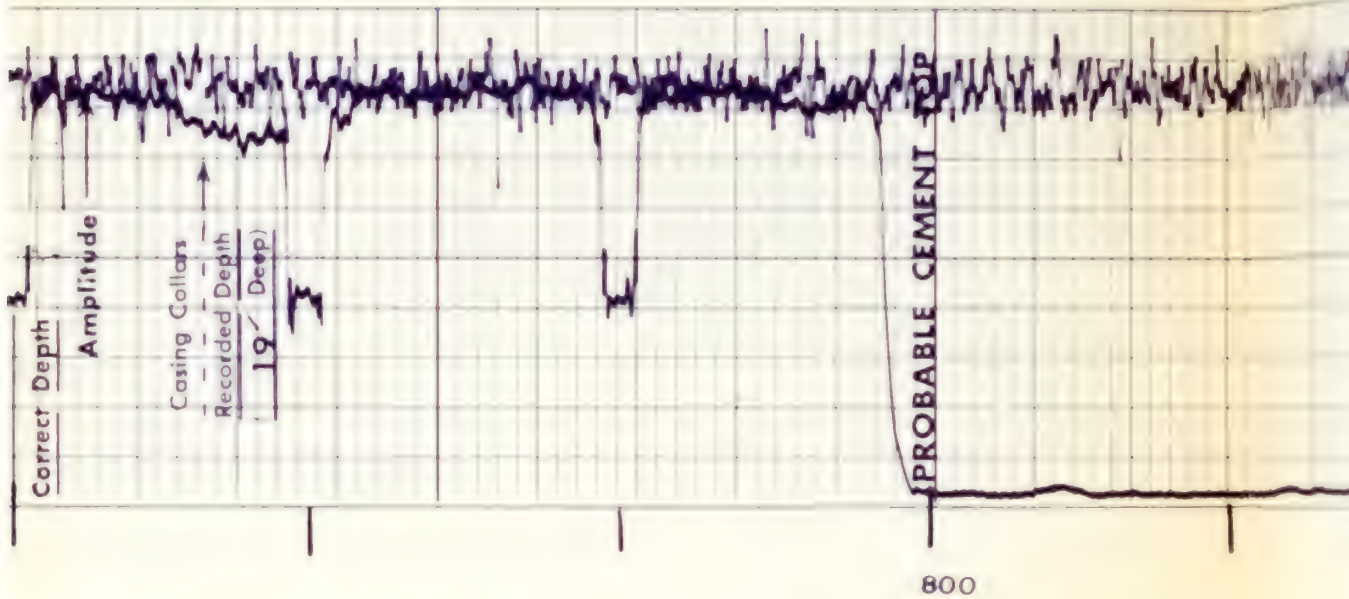
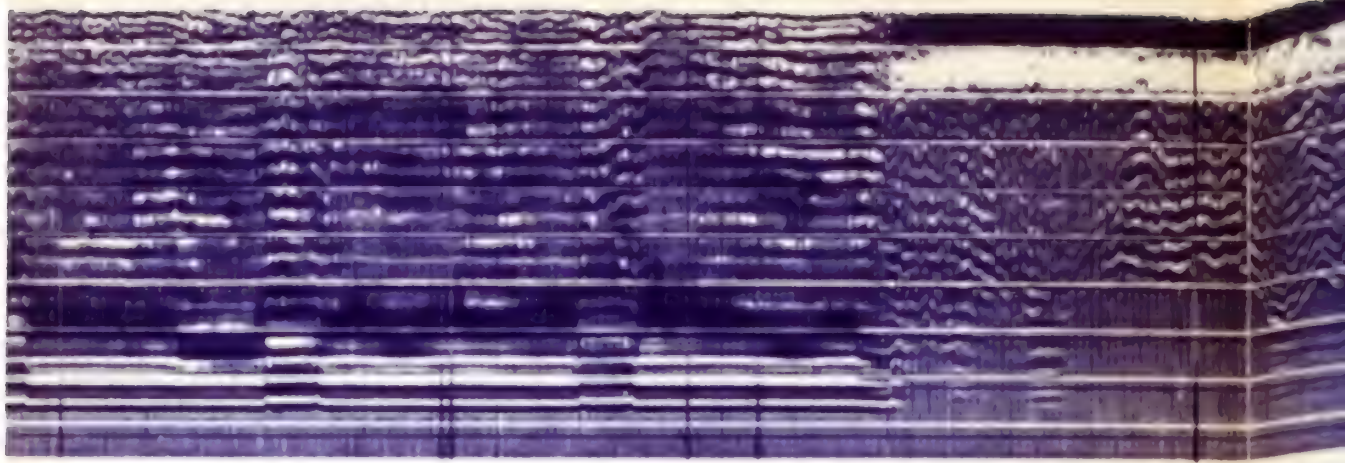


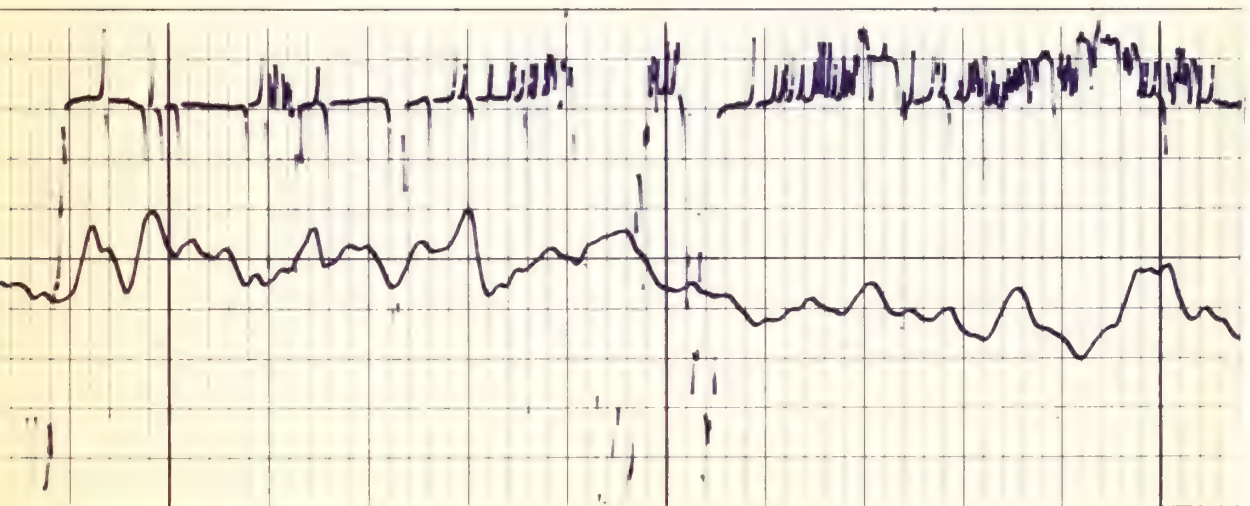
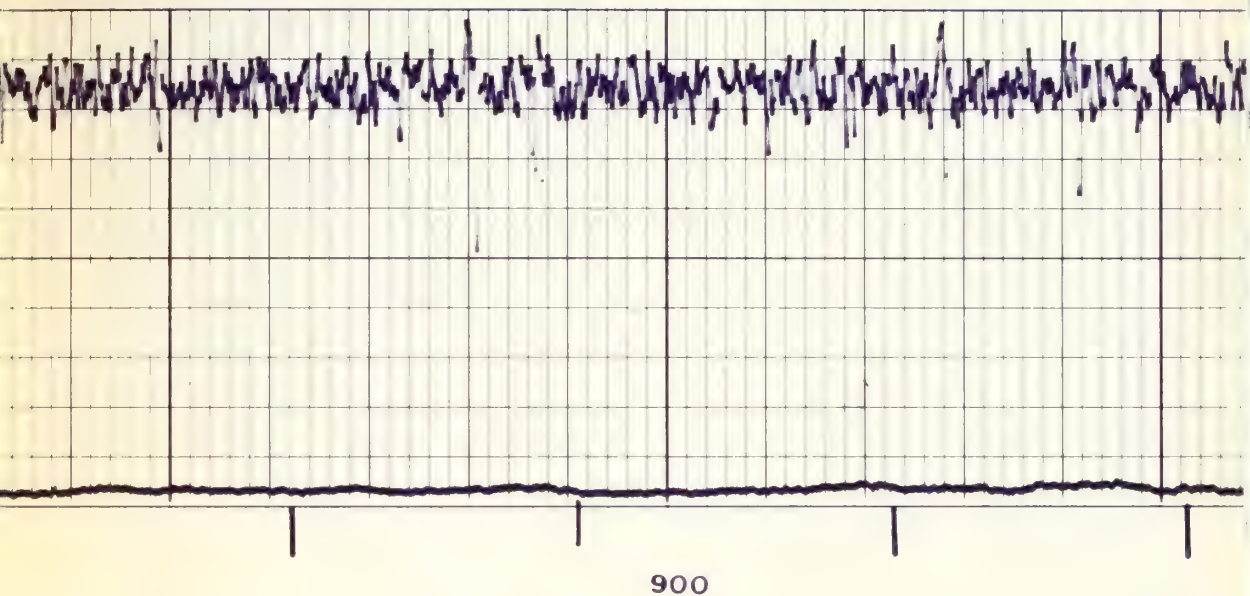
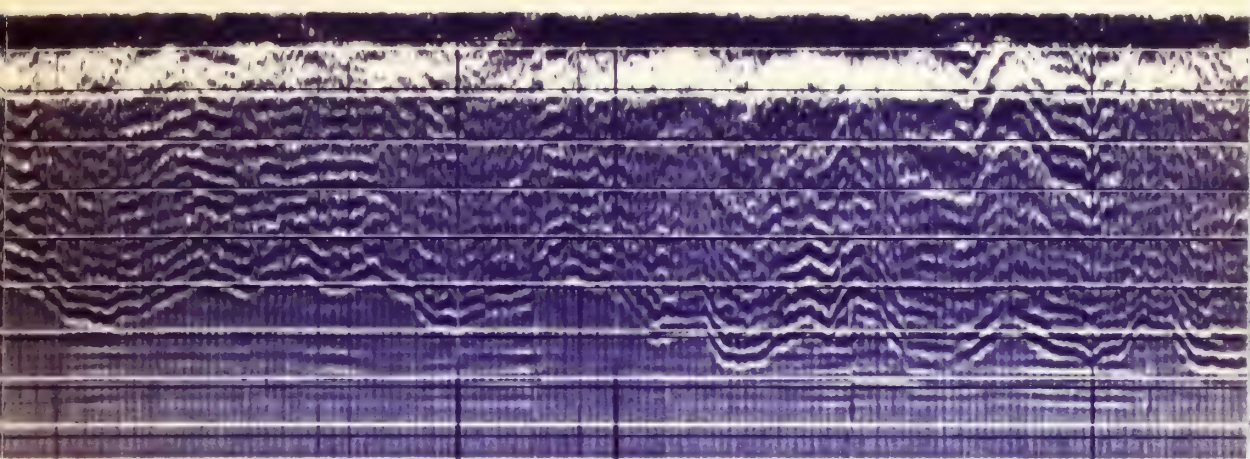
NO. 1
LONG
STRING

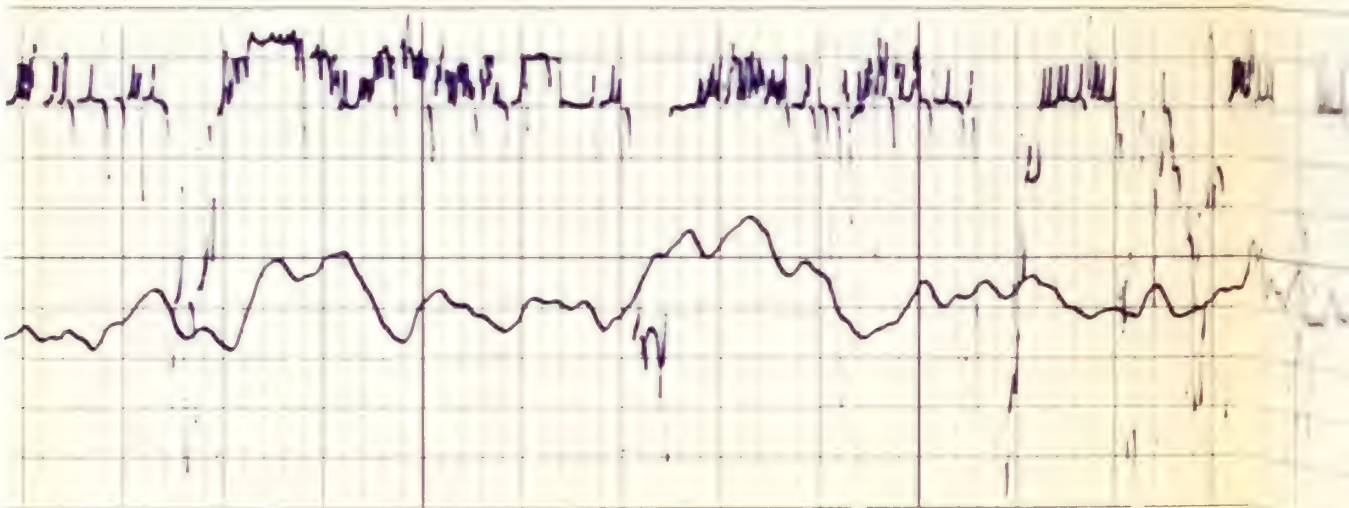
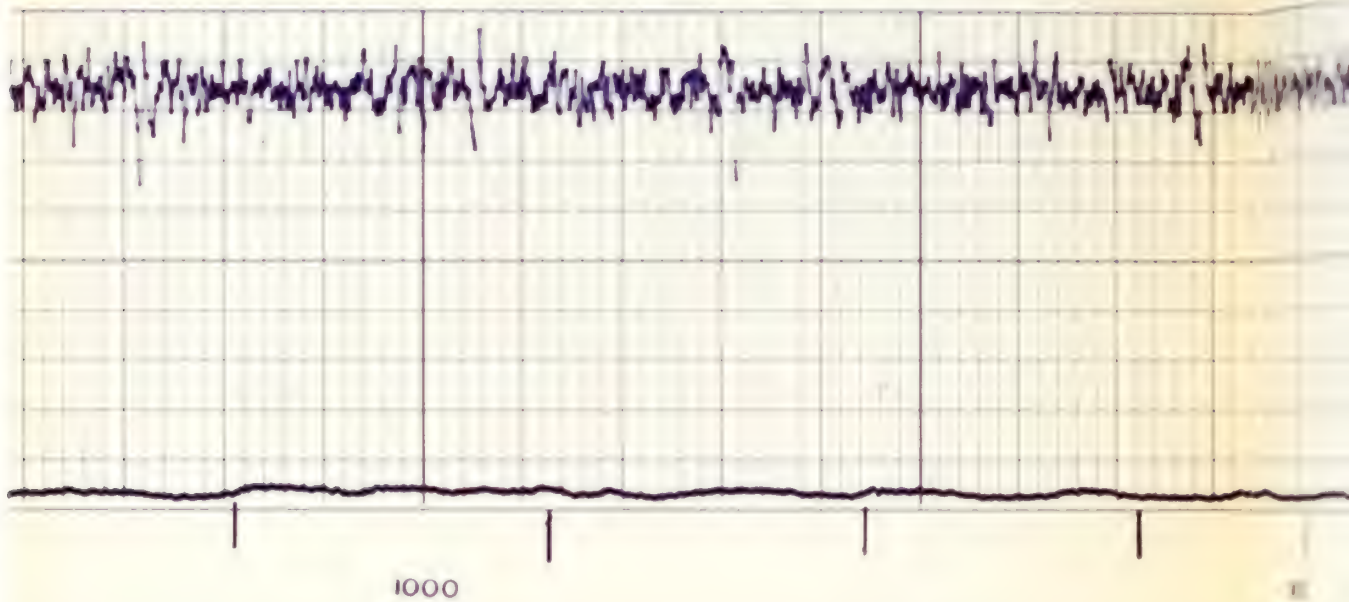
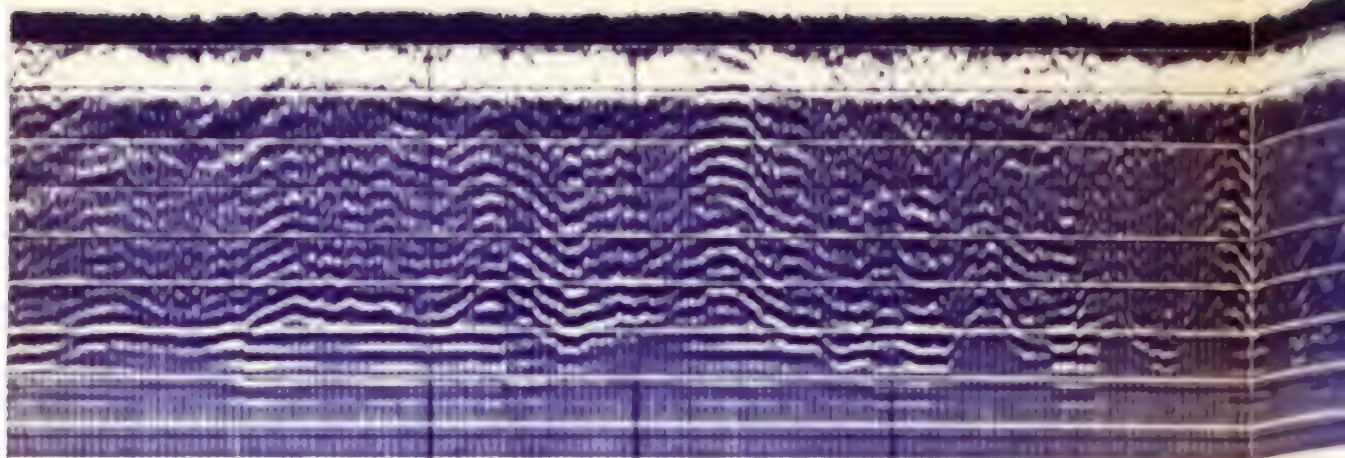
700

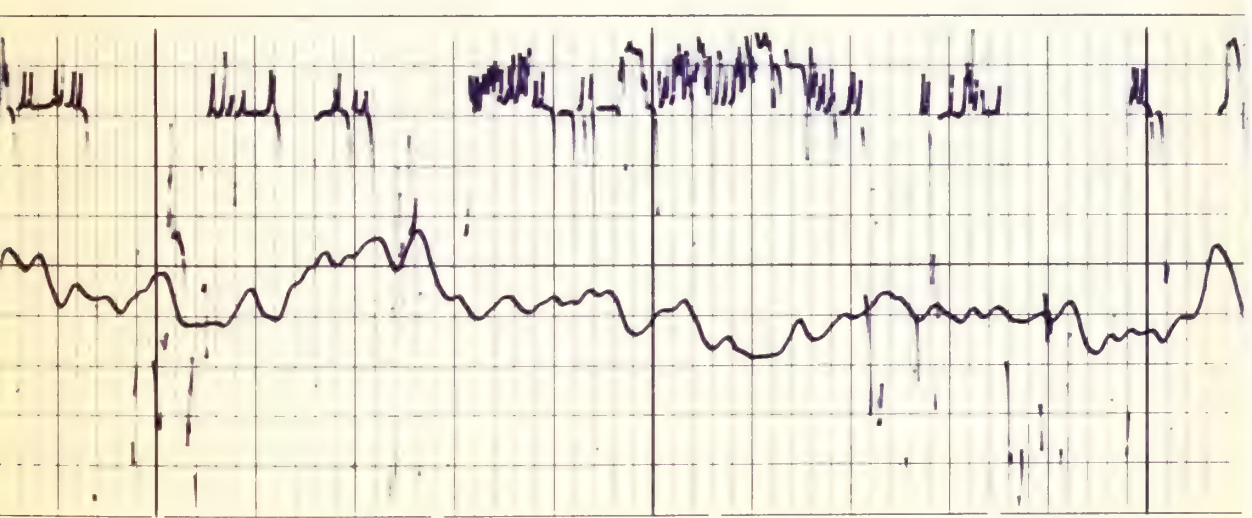
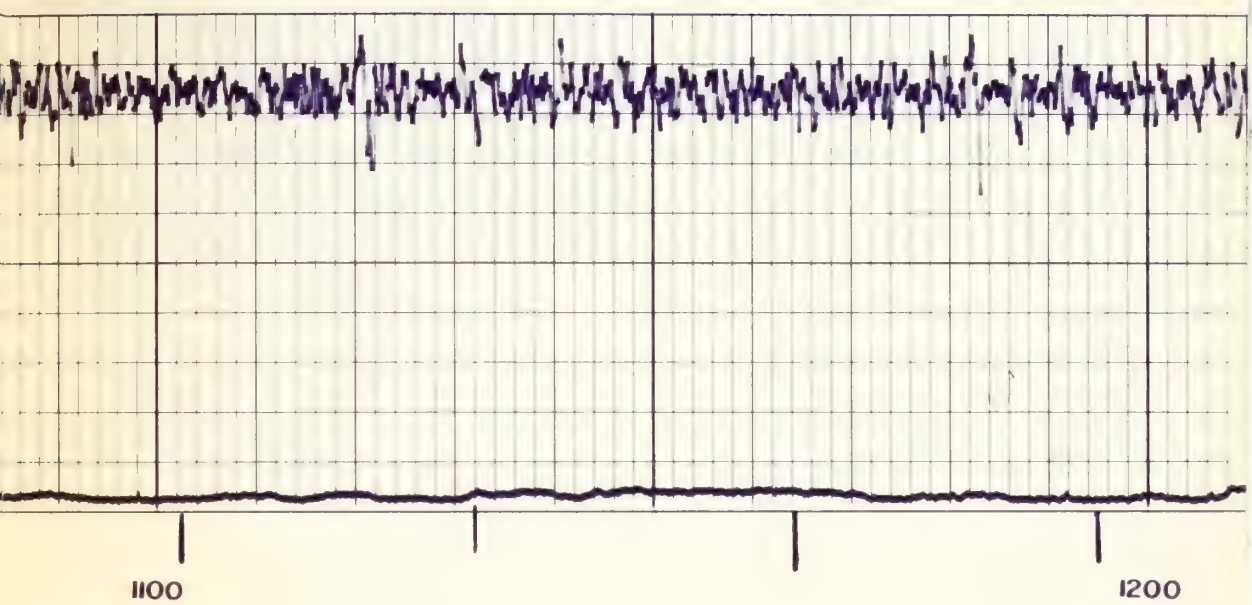
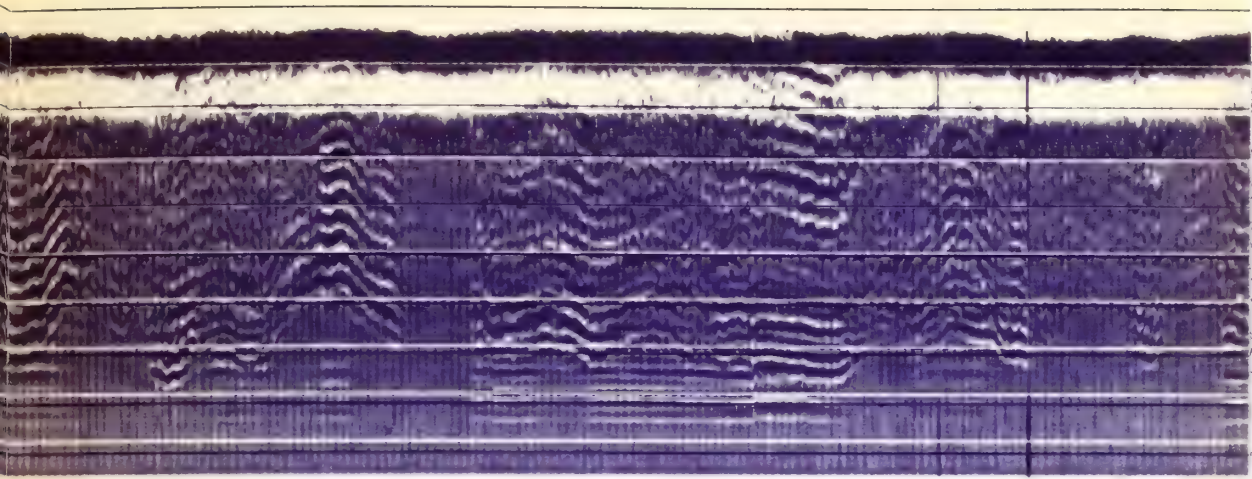


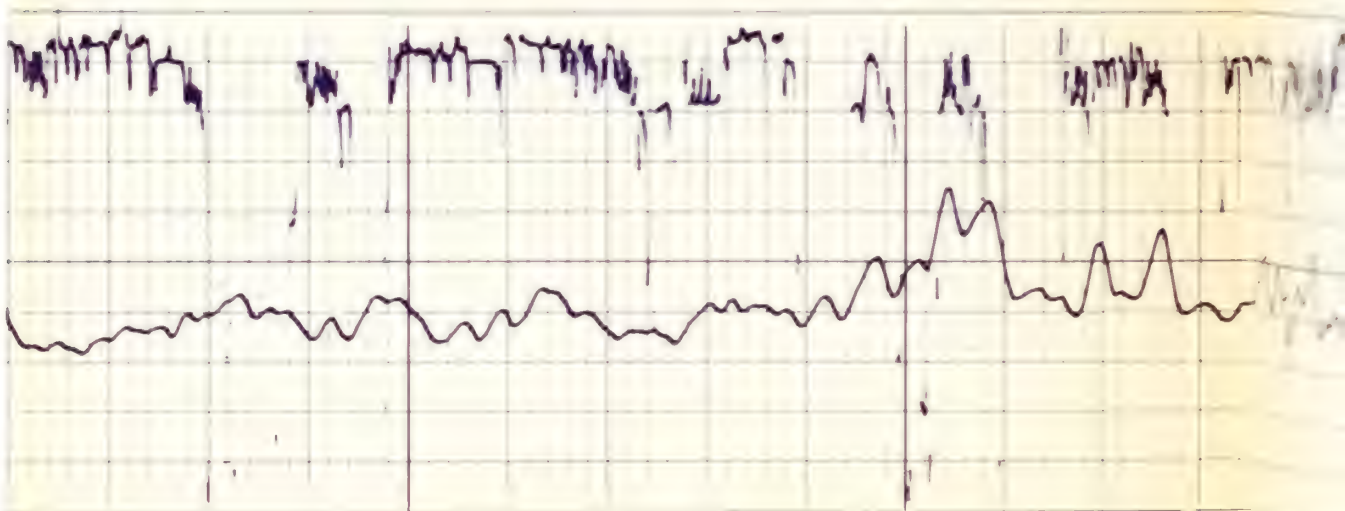
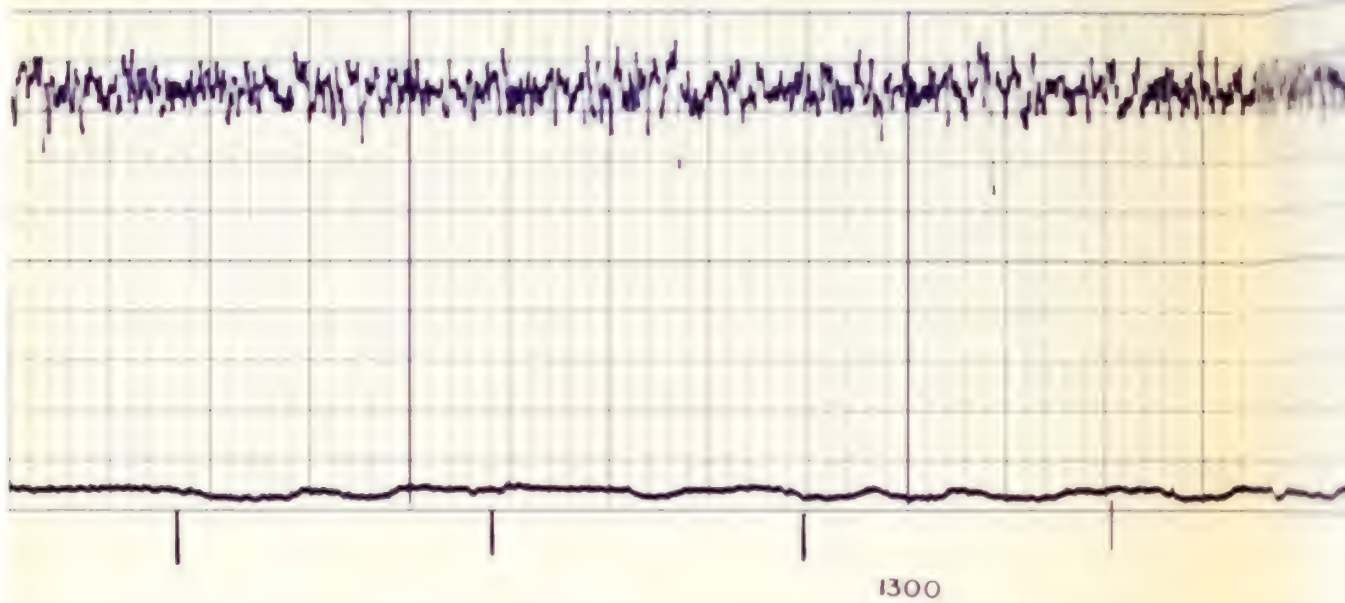
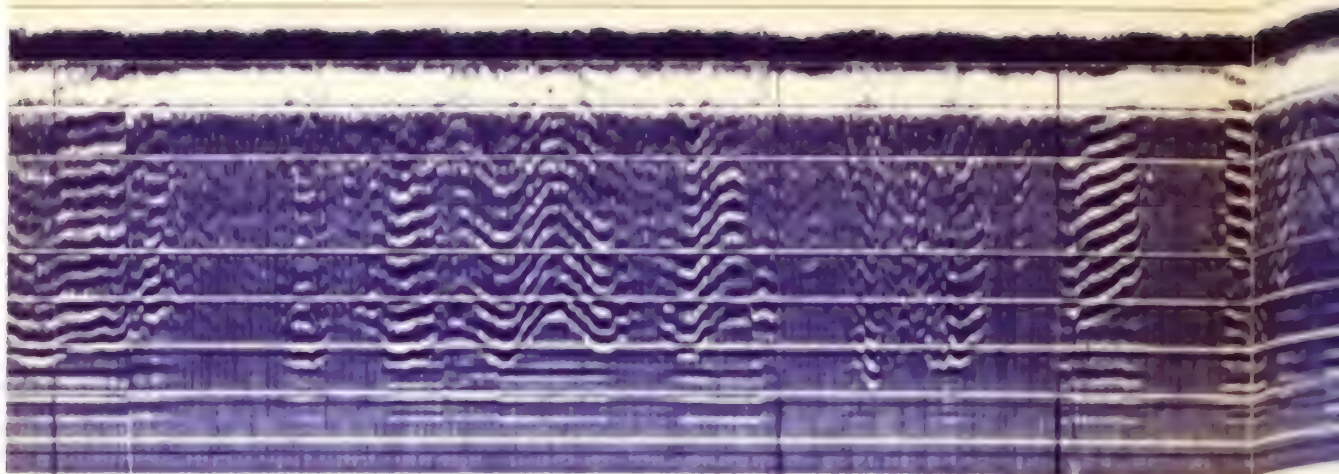
Casing Collars

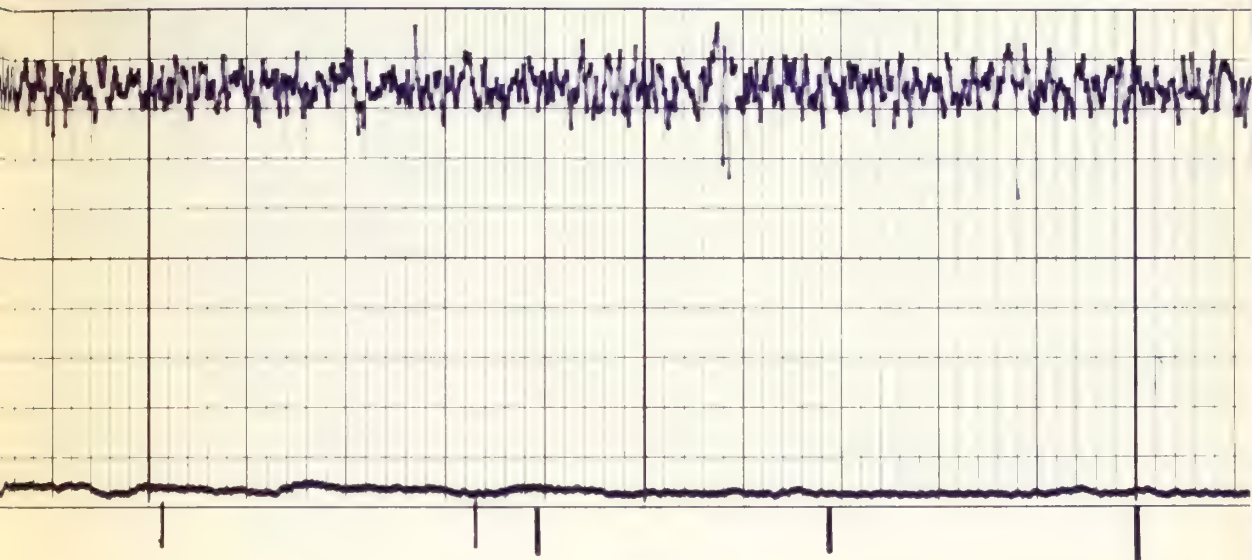
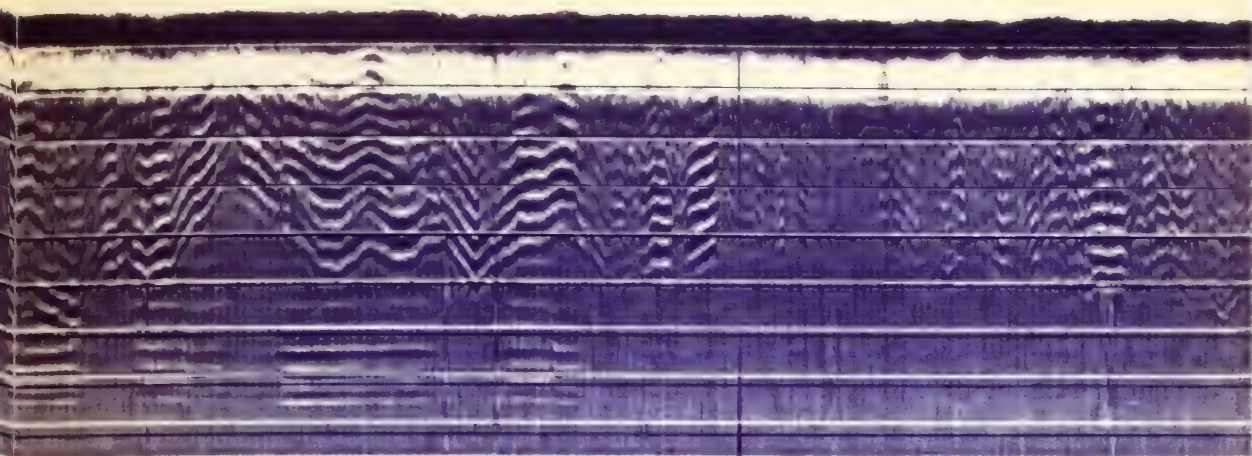




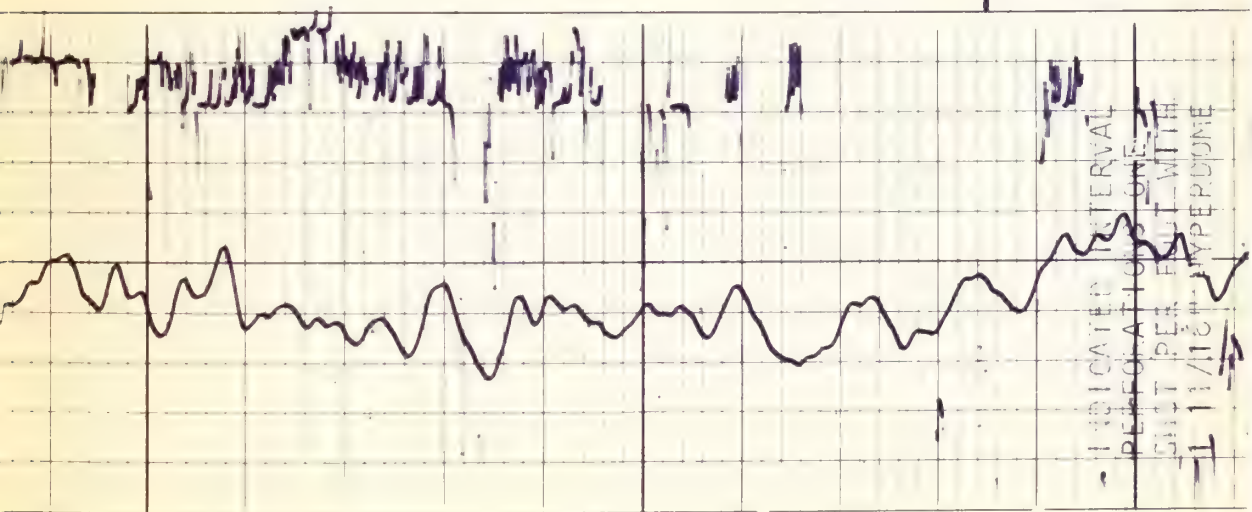




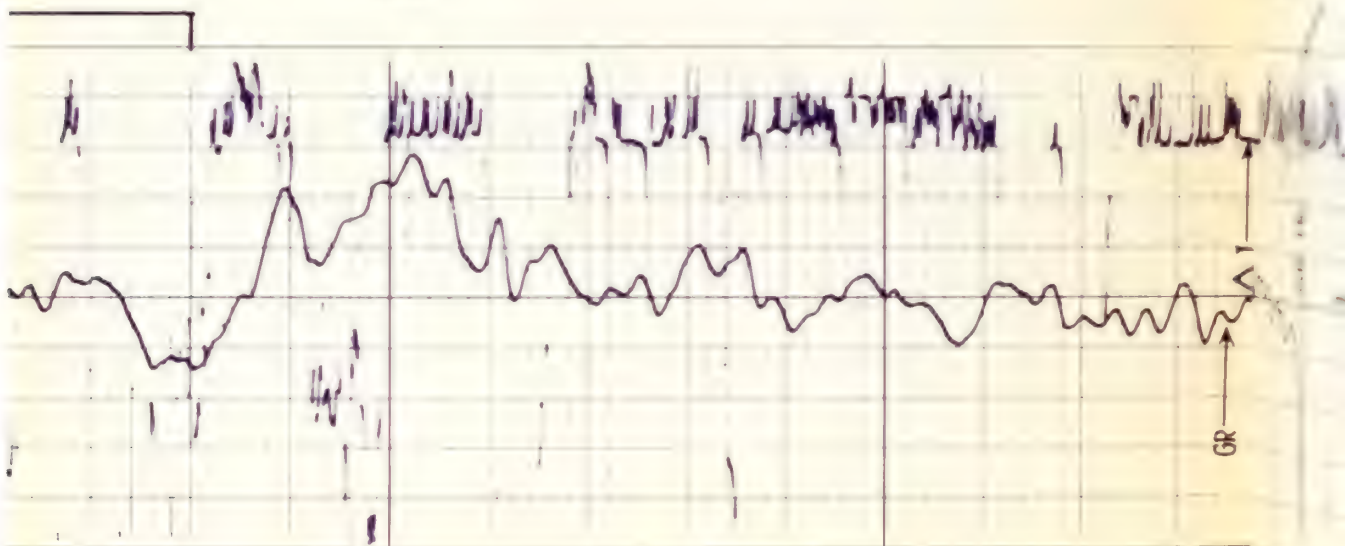
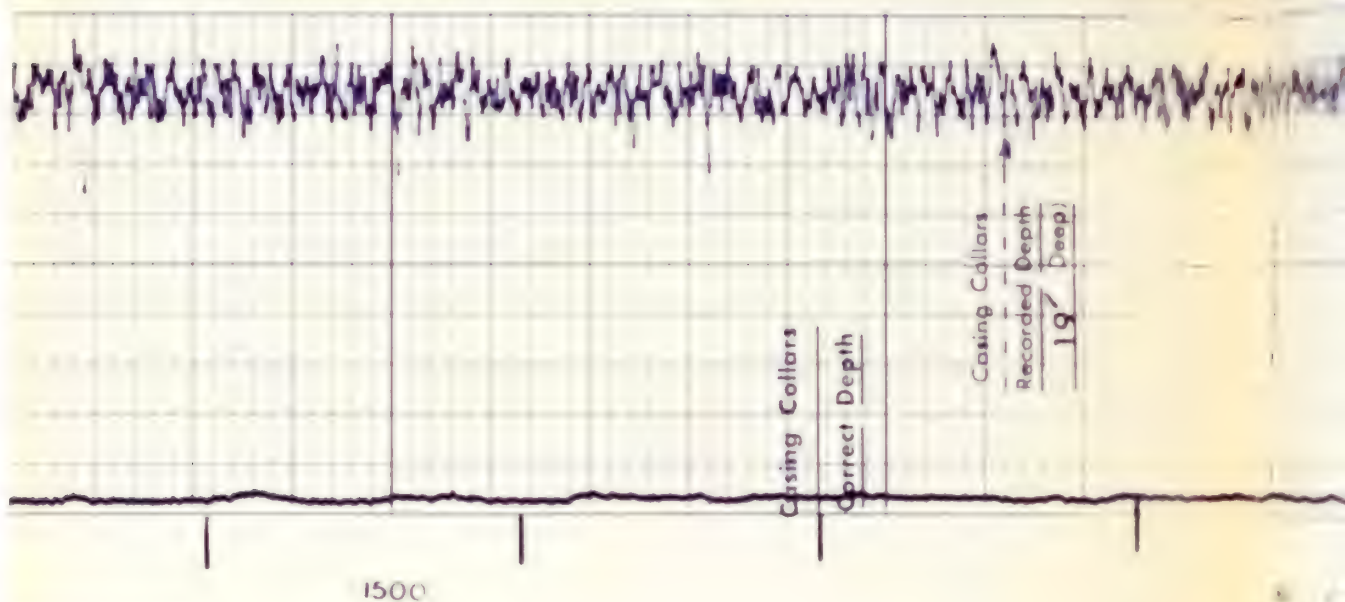
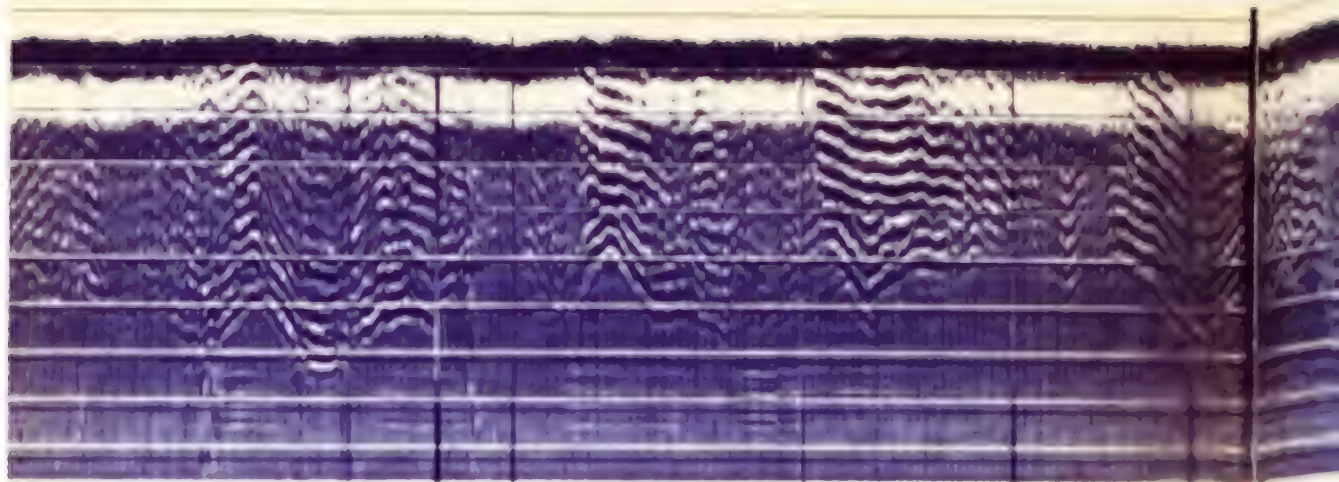


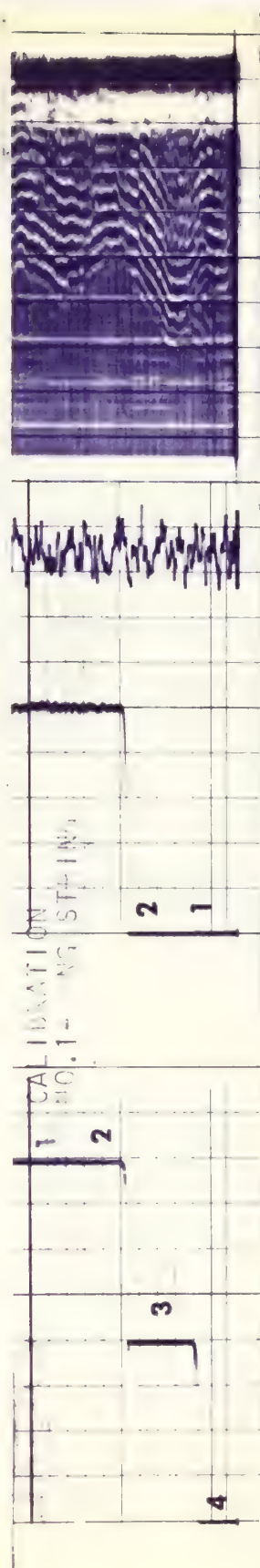
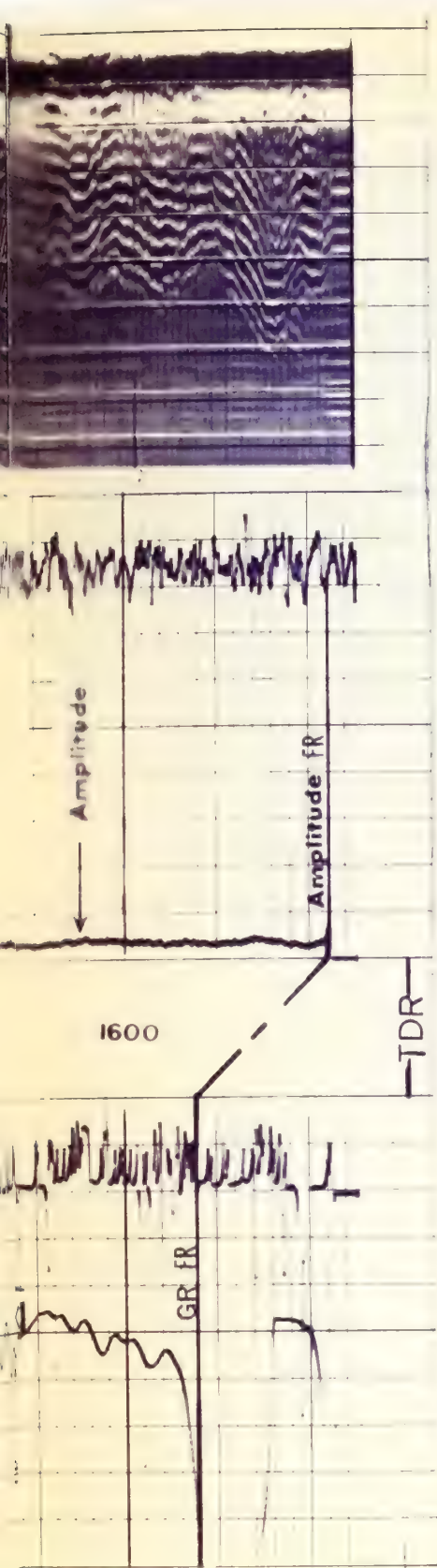


1400



INDICATED INTERVAL
PERFORATION ONE
SILT PER FOOT WITH
11/10 HYPERDUNE





REPEAT SECTION

4000
1000
5000

4

3

2
1

700

Casing Collars

Correct Depth

Casing Collars

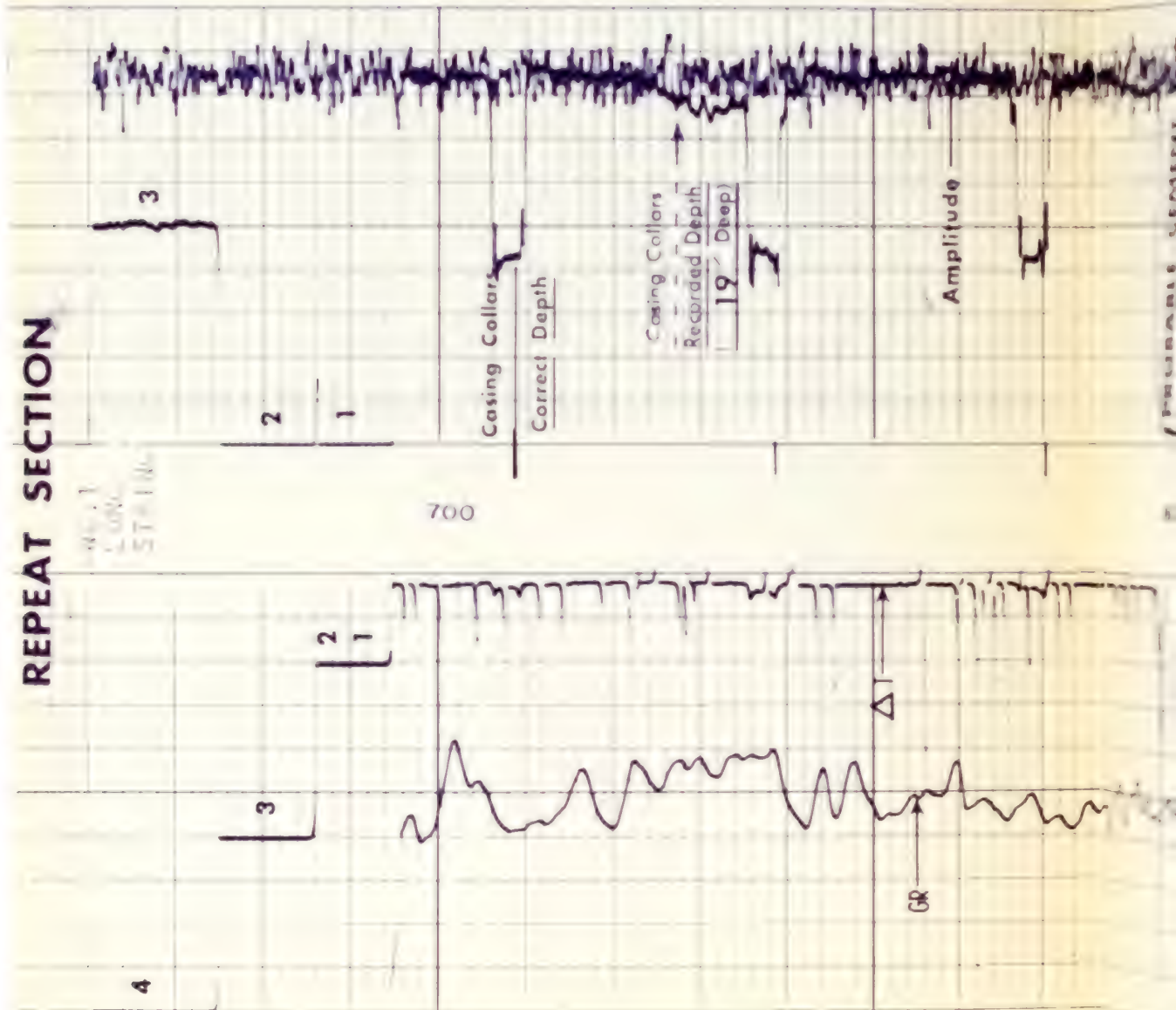
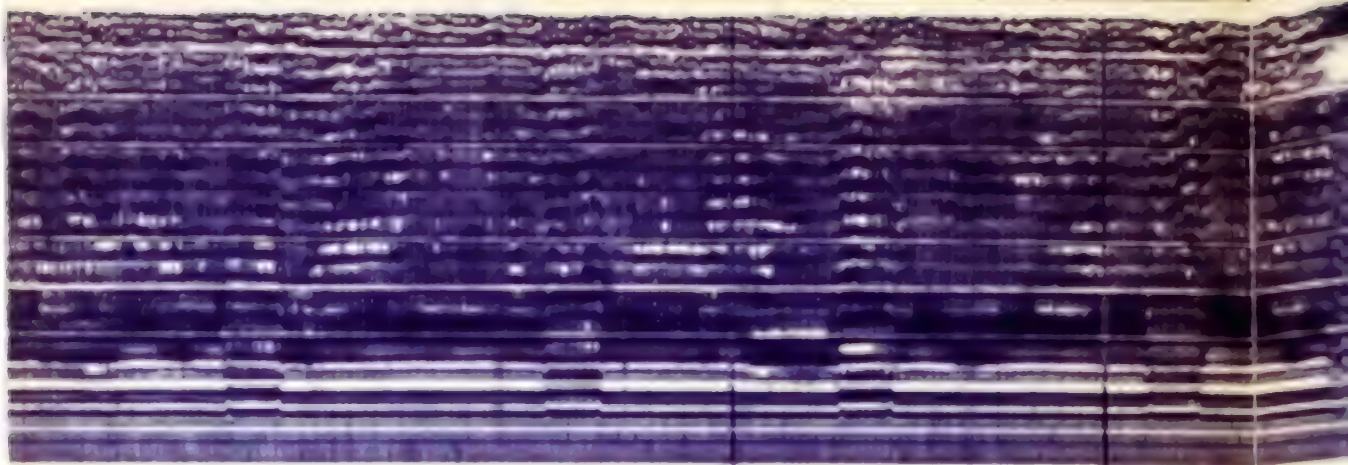
Recorded Depth

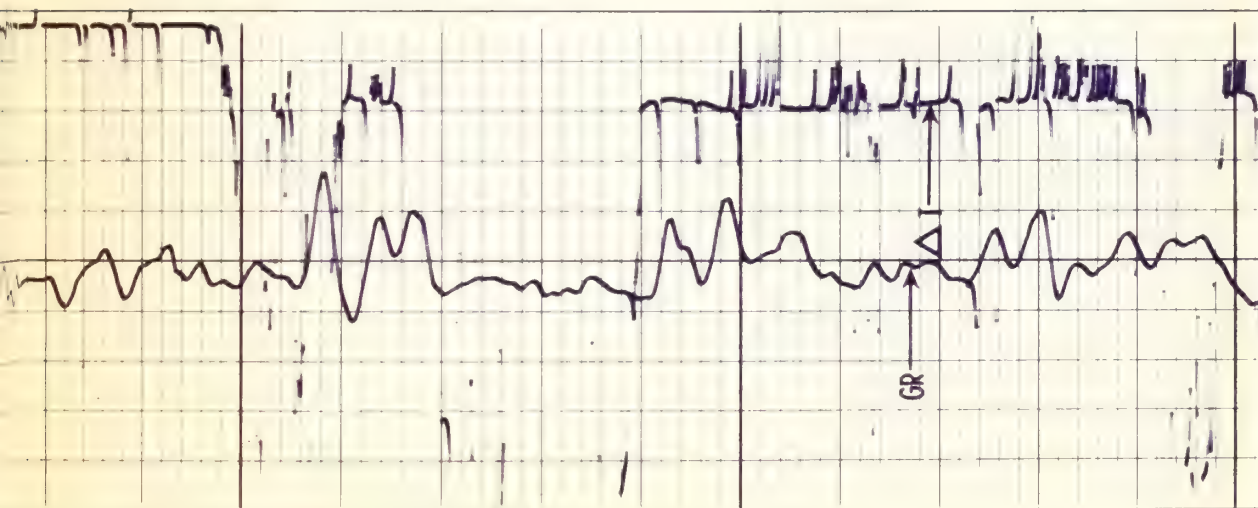
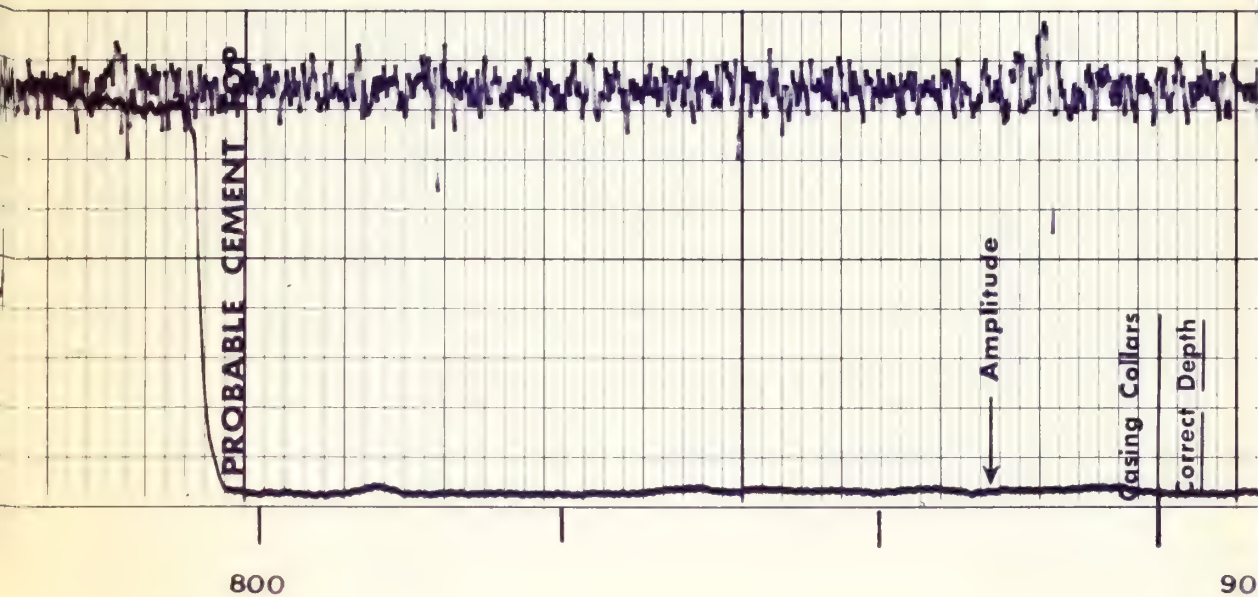
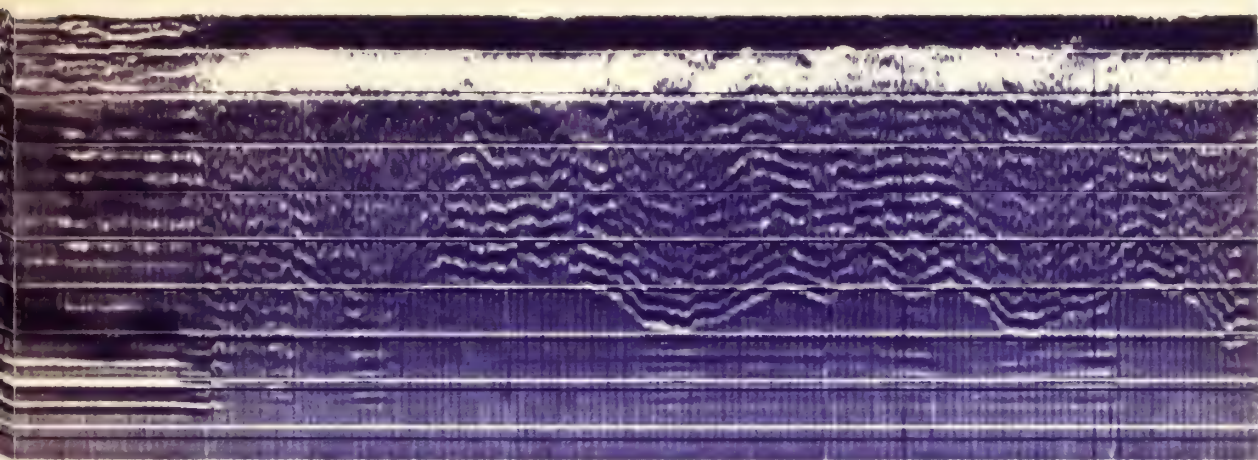
19' Deep

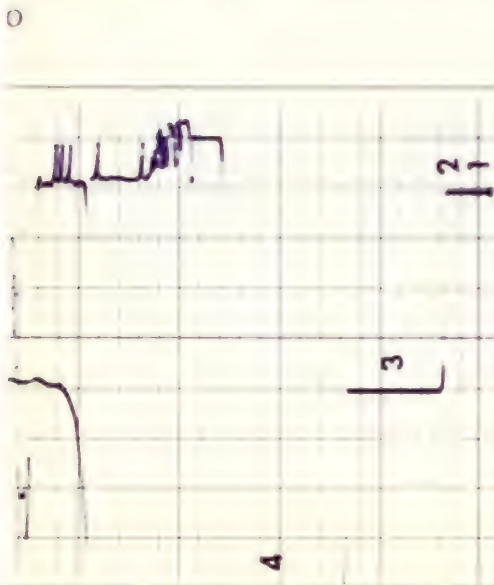
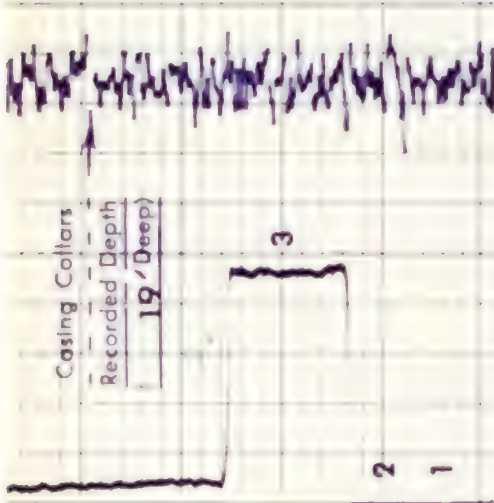
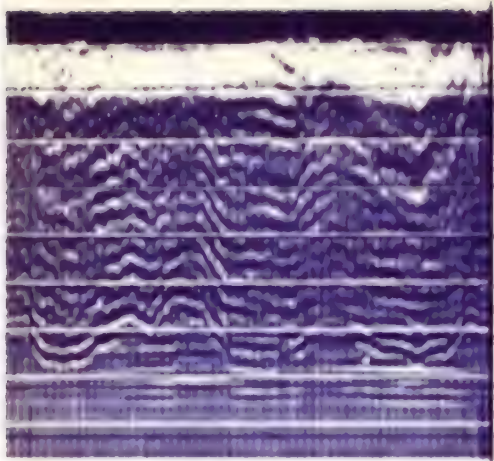
Amplitude

GR

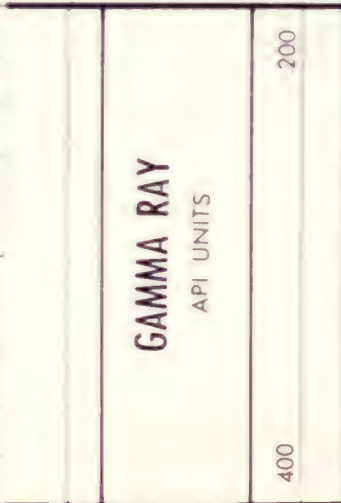
Δ







DEPTHS

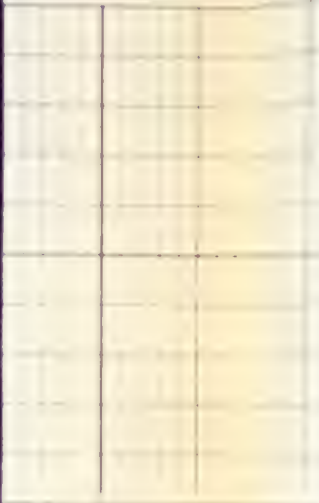


VARIABLE DENSITY
5 FEET

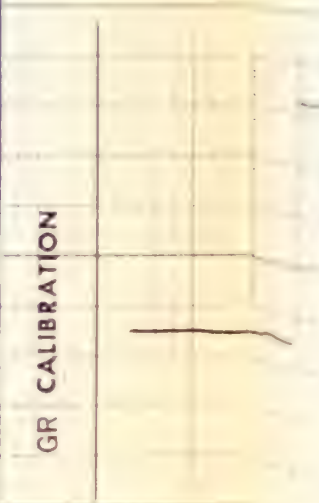
BOND LOG
MILLIVOLTS

DEPTHS

GAMMA RAY
API UNITS



DEPTHS



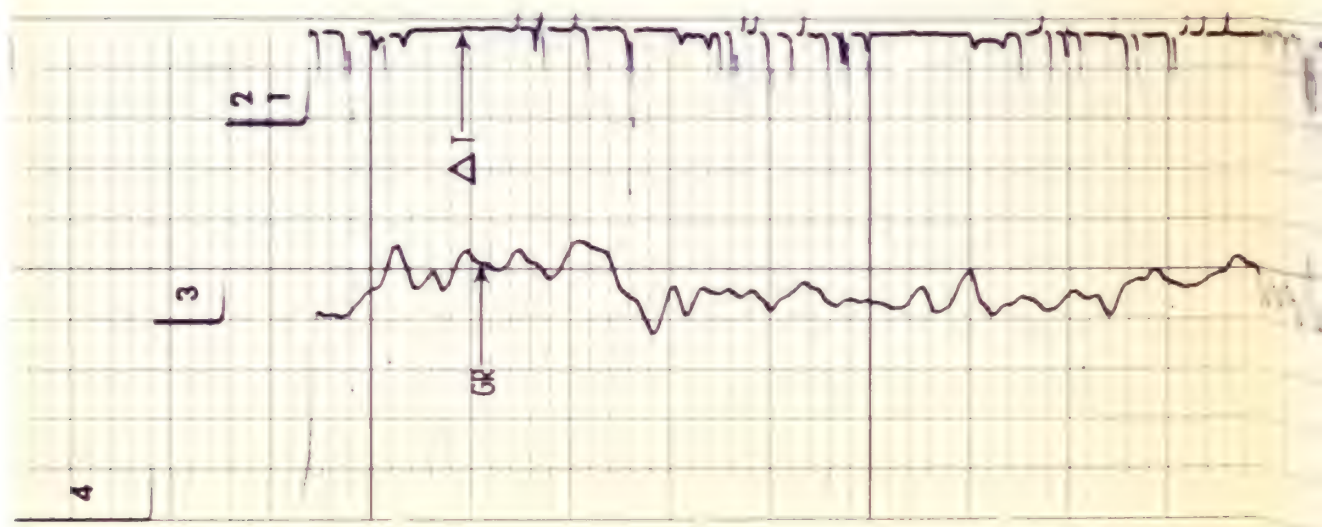
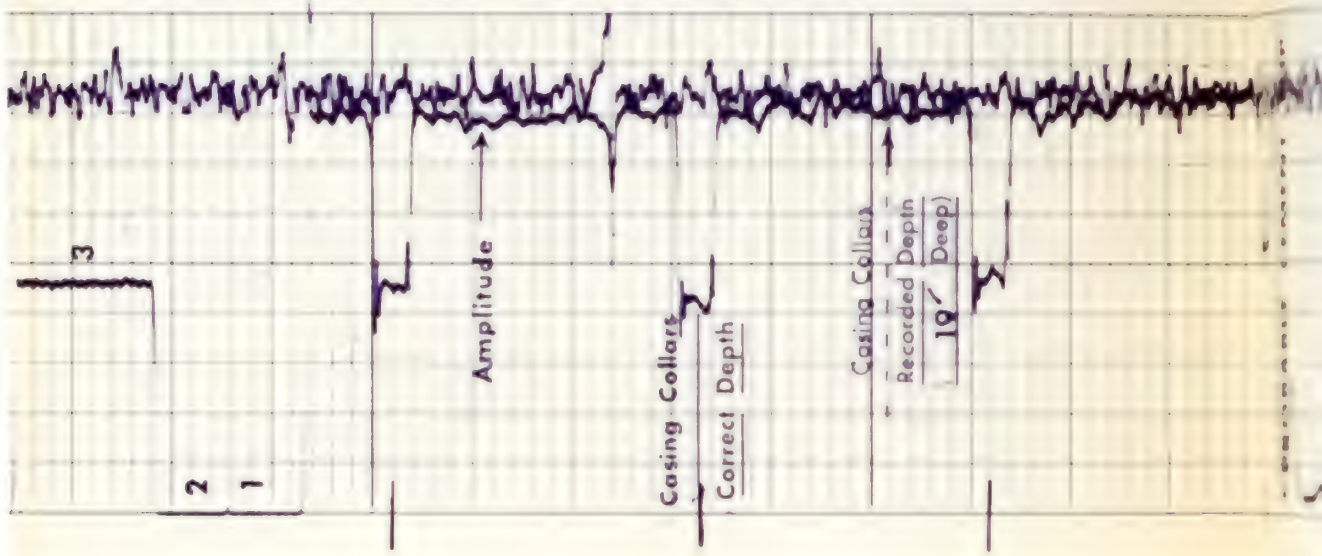
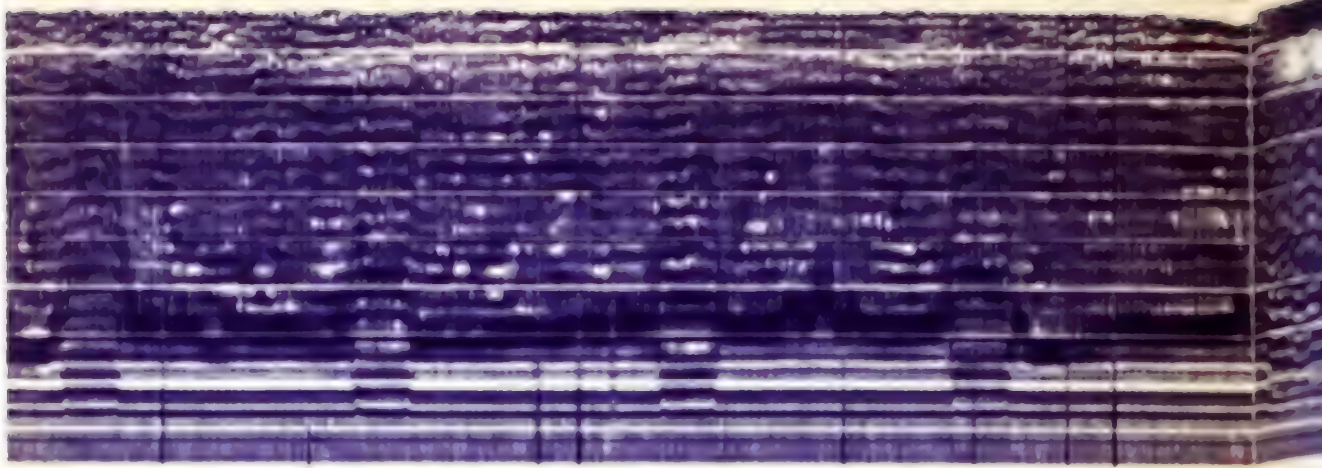
BACKGROUND

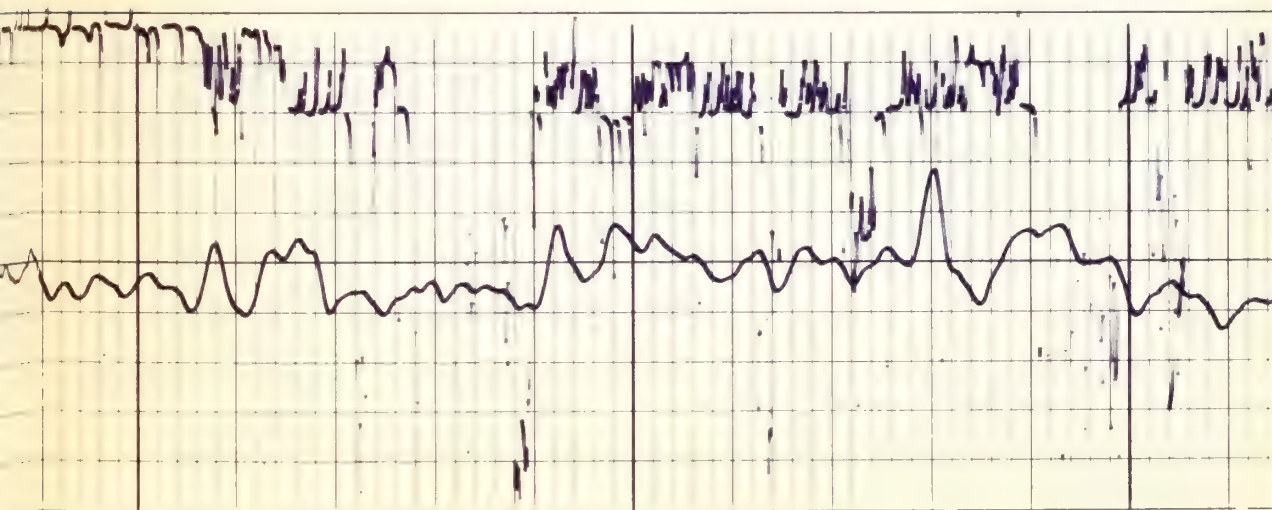
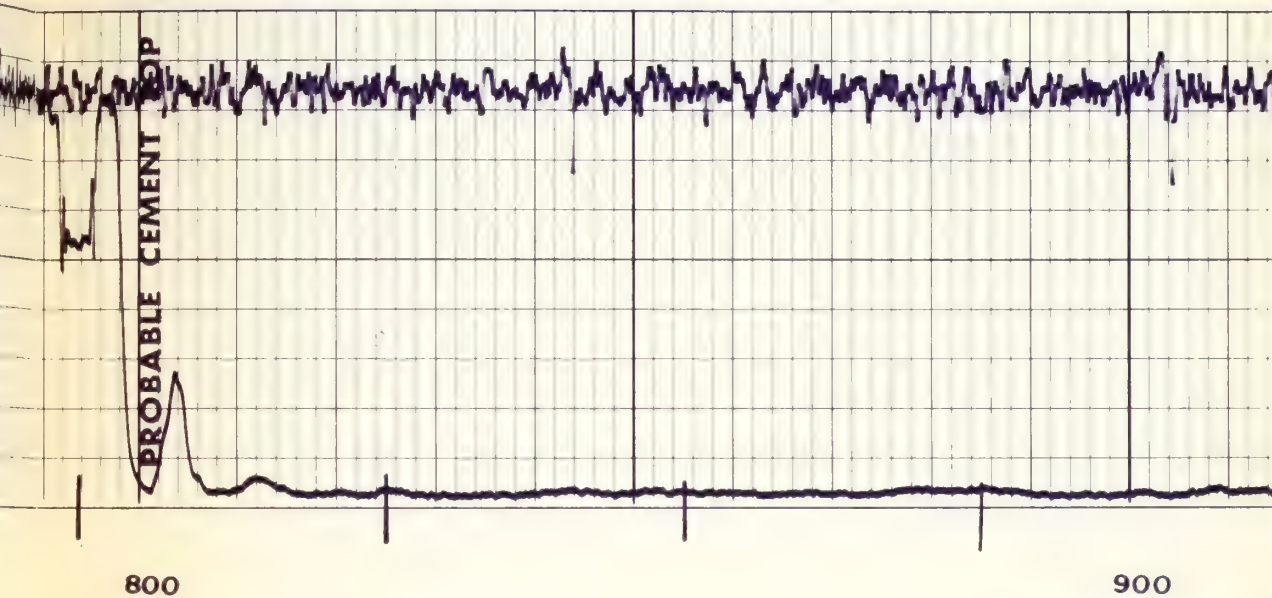
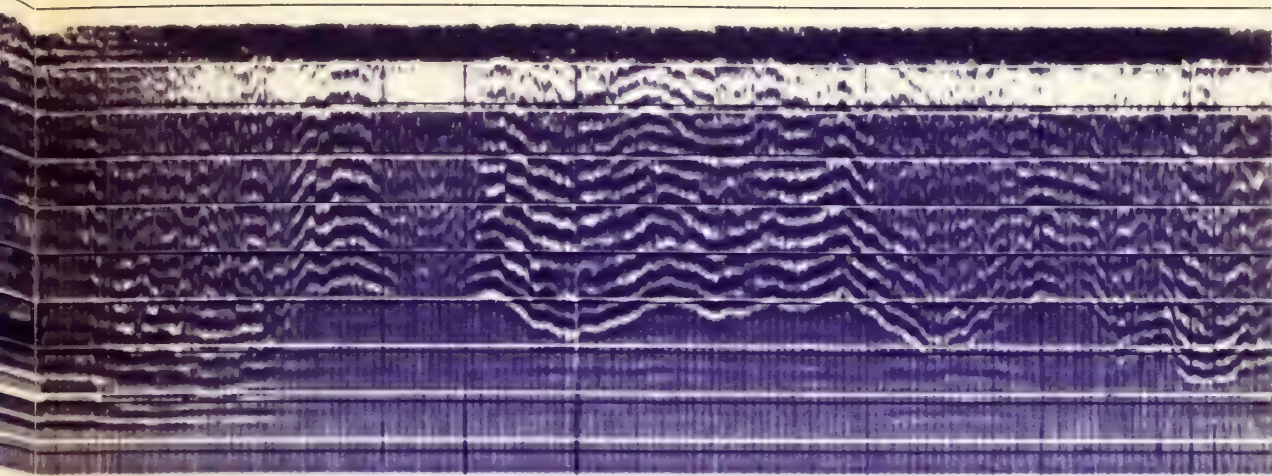
PILL IN PLACE

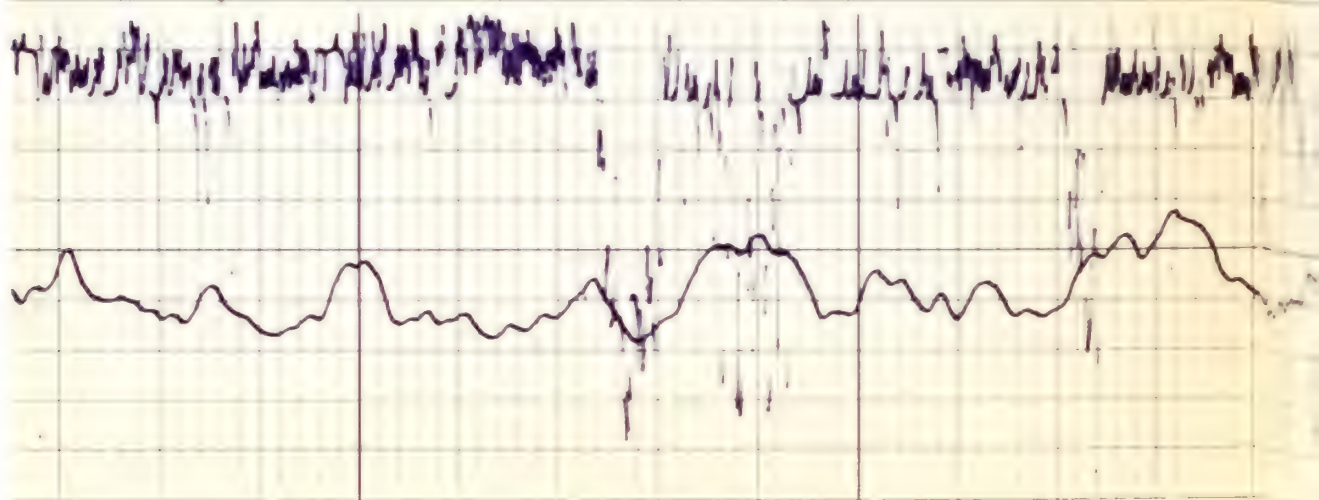
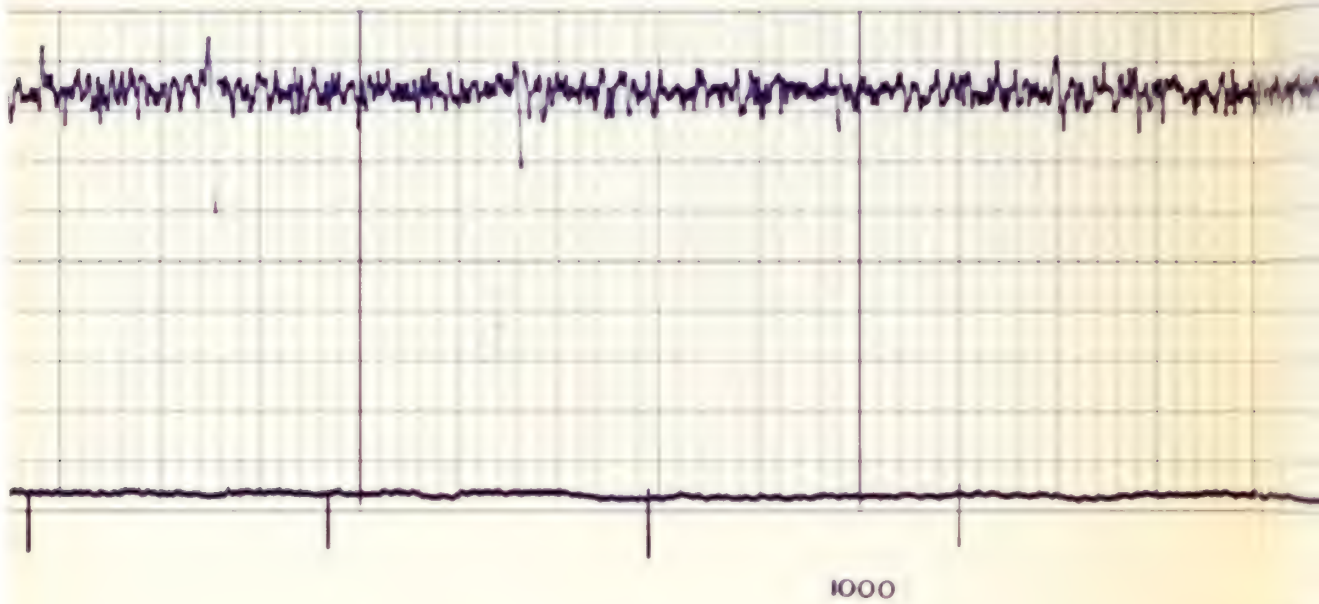
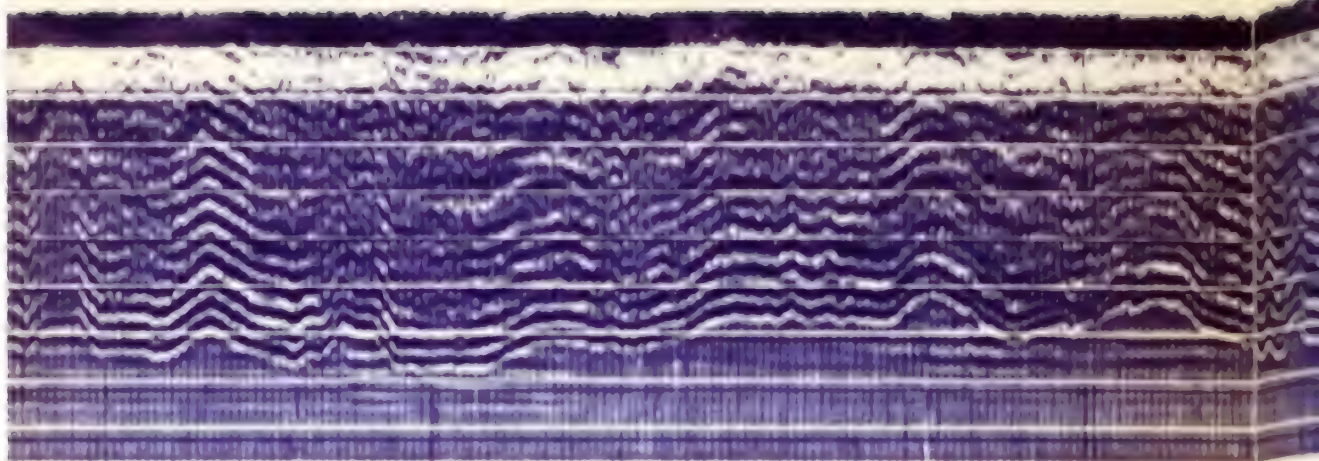
MECH. ZERO

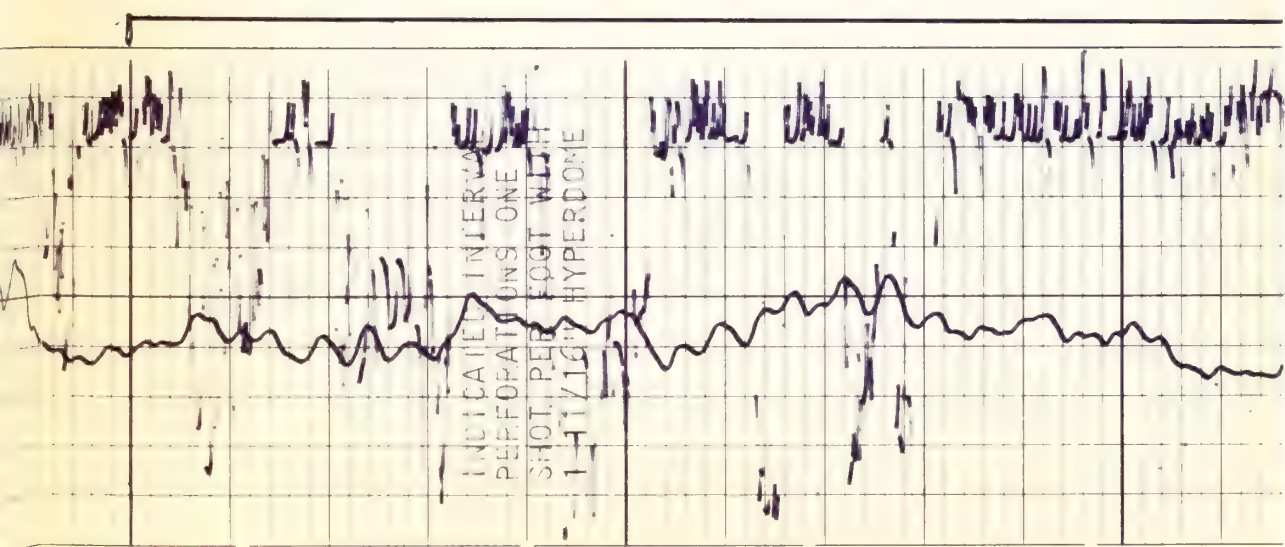
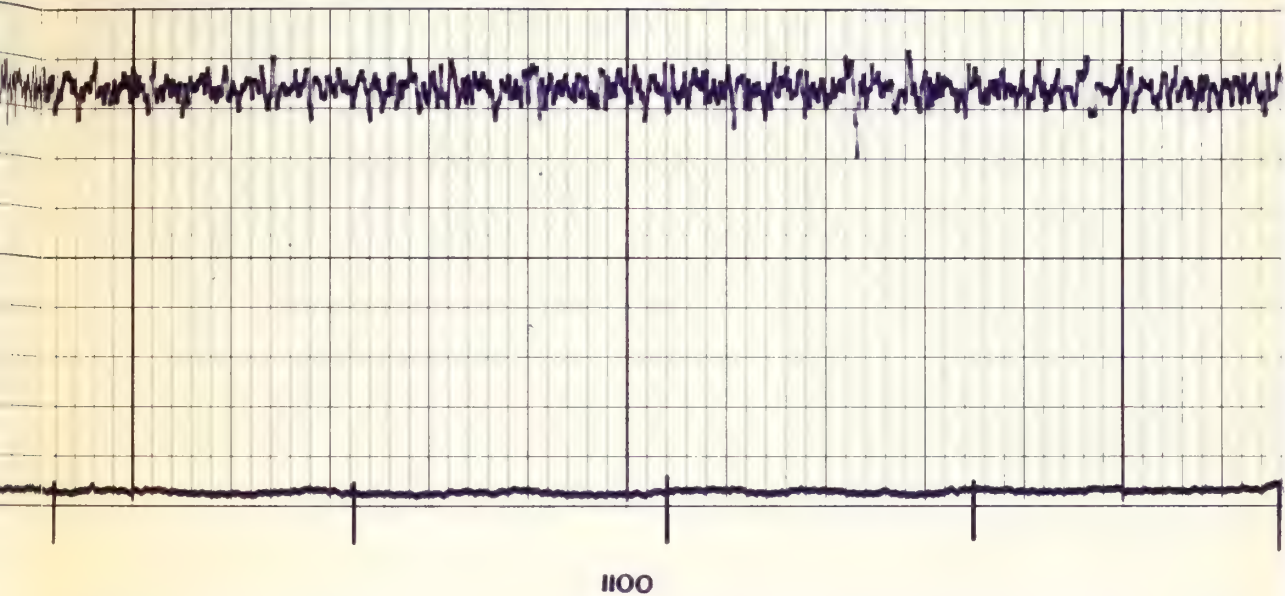
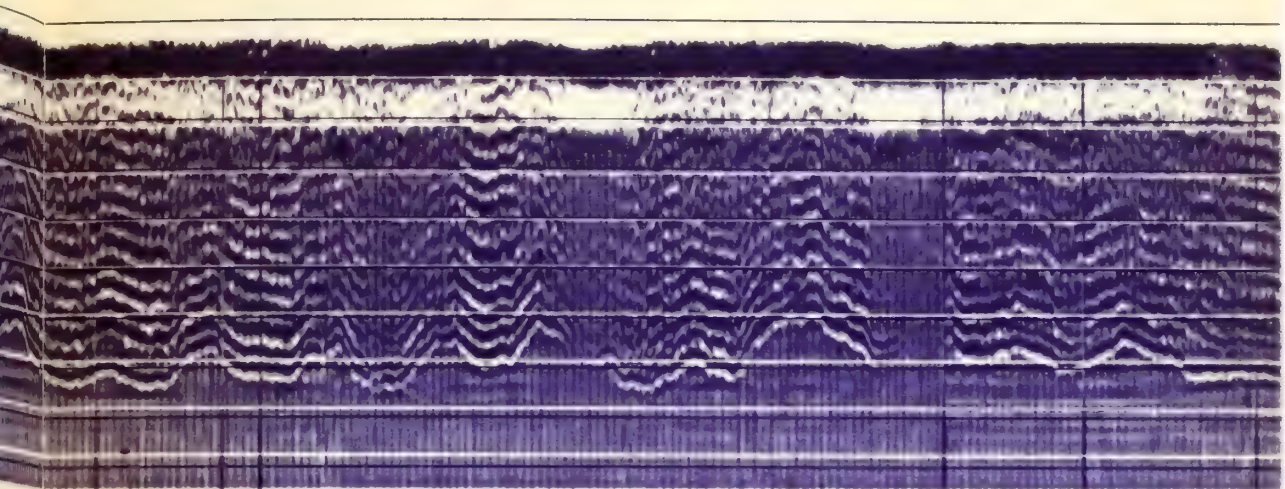
NO. 2
MIDDLE
STRINGS

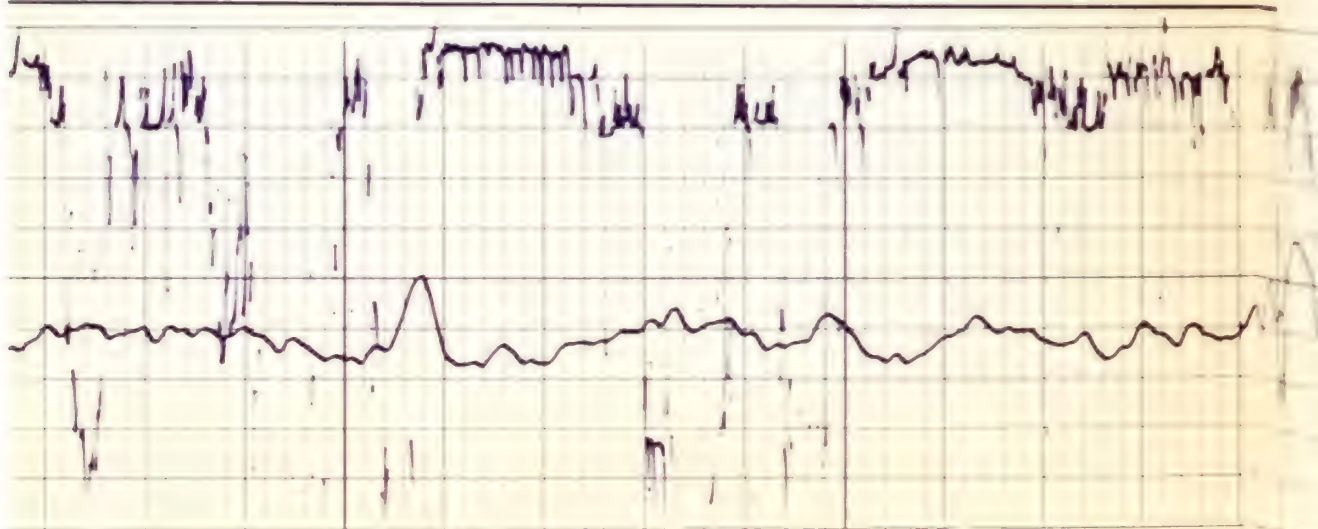
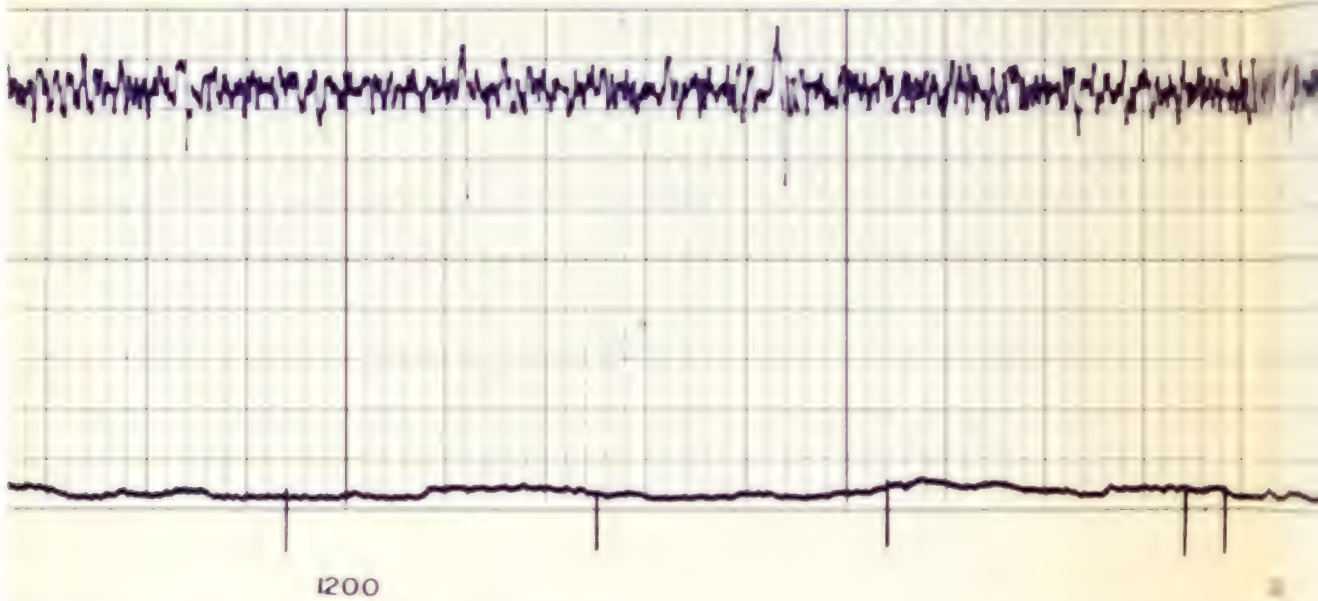
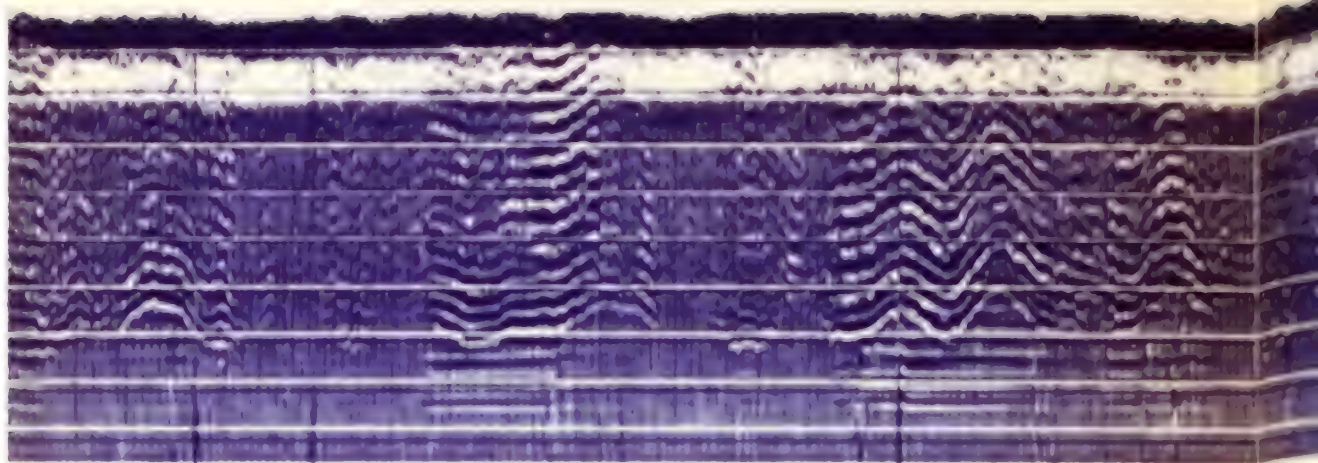
Handwritten signature

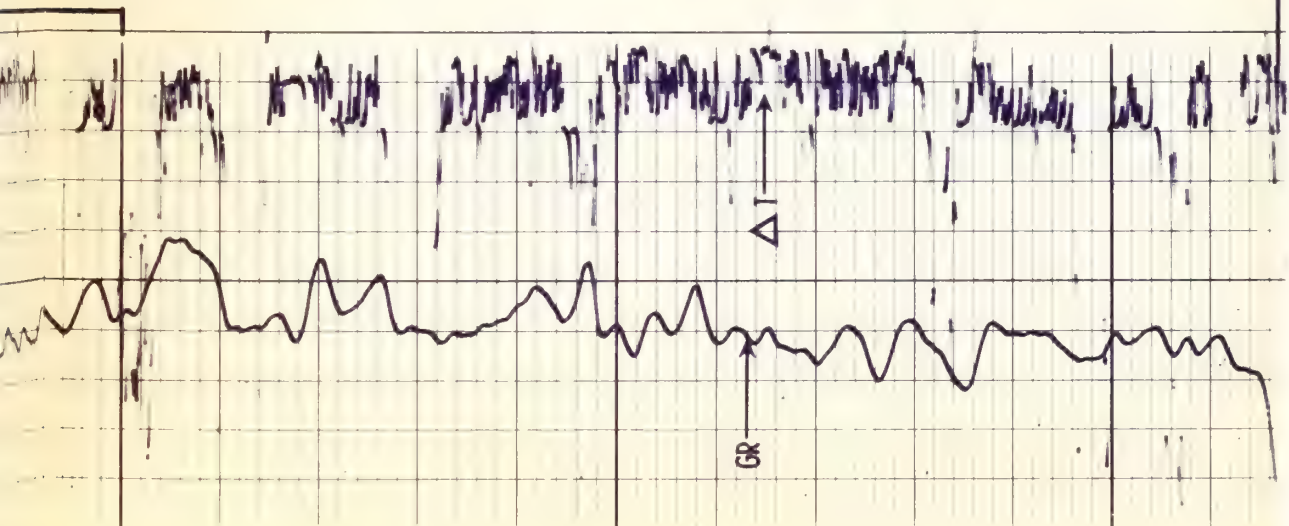
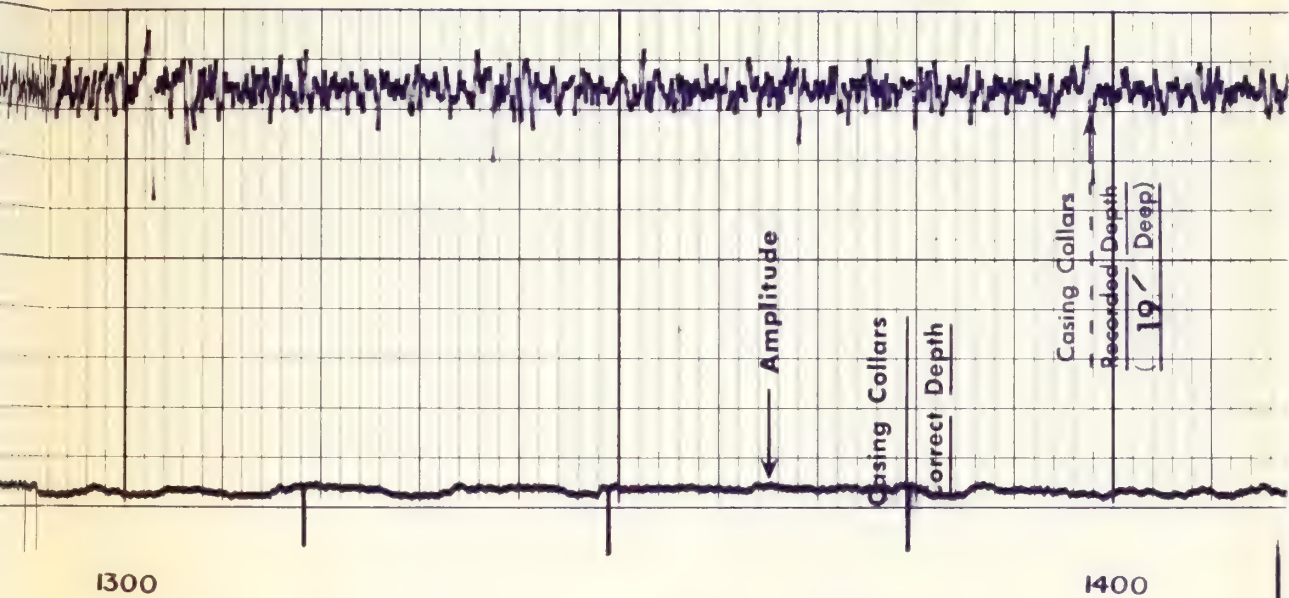
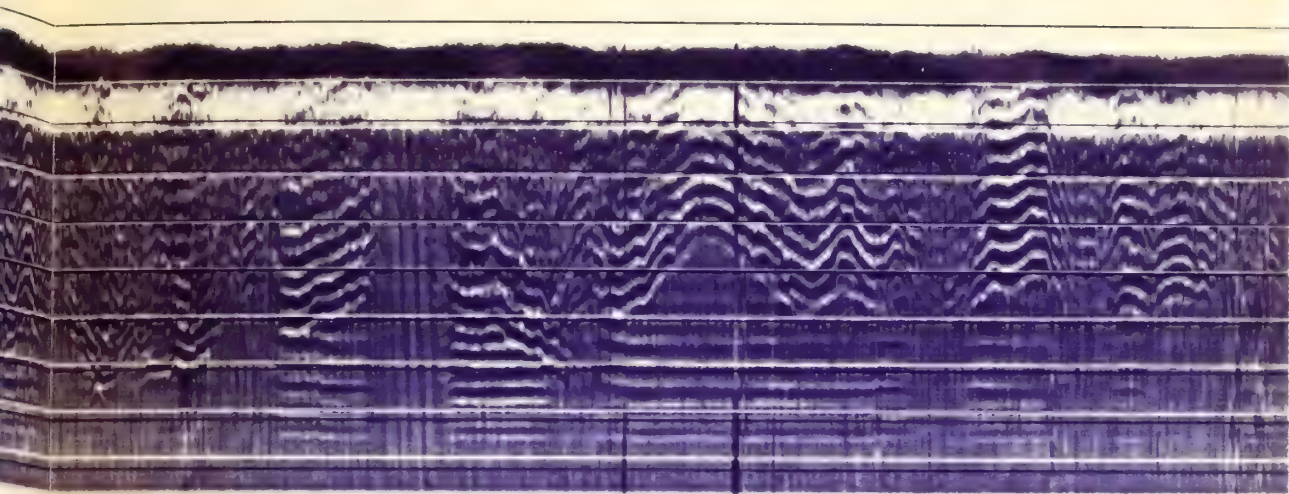


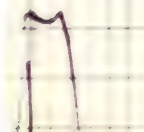
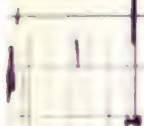
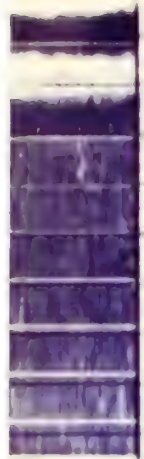








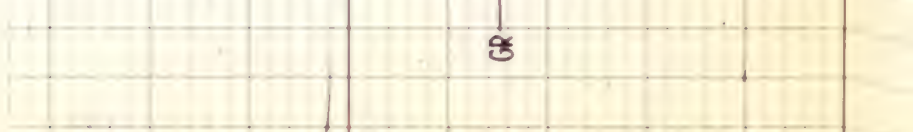
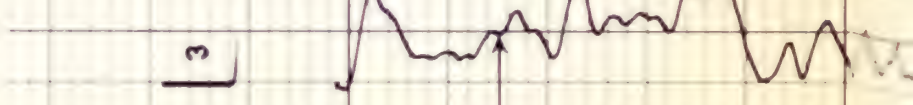
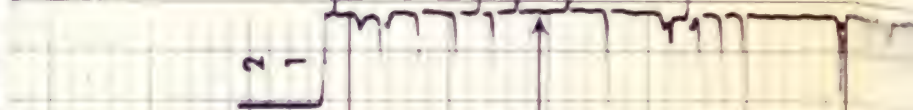
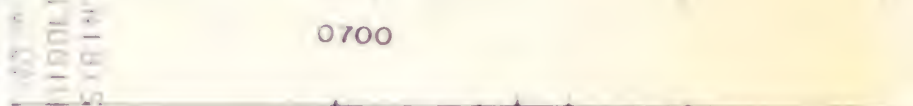
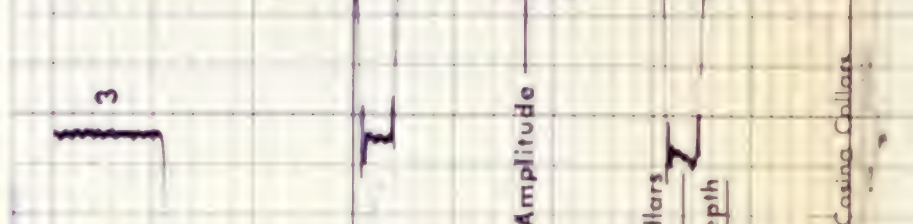
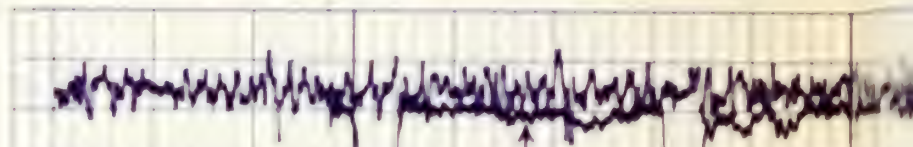
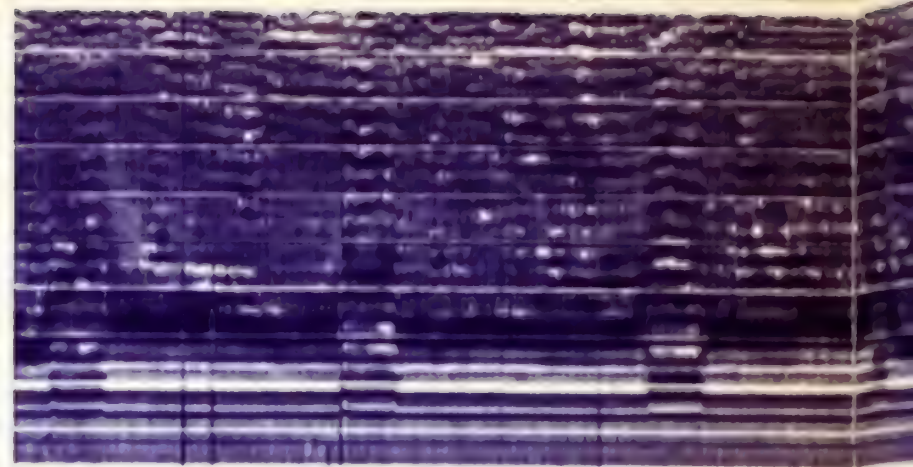




FR

REPEAT SECTION

100 ft
MIDDLE
STRING



4

3

2

1

0700

GR

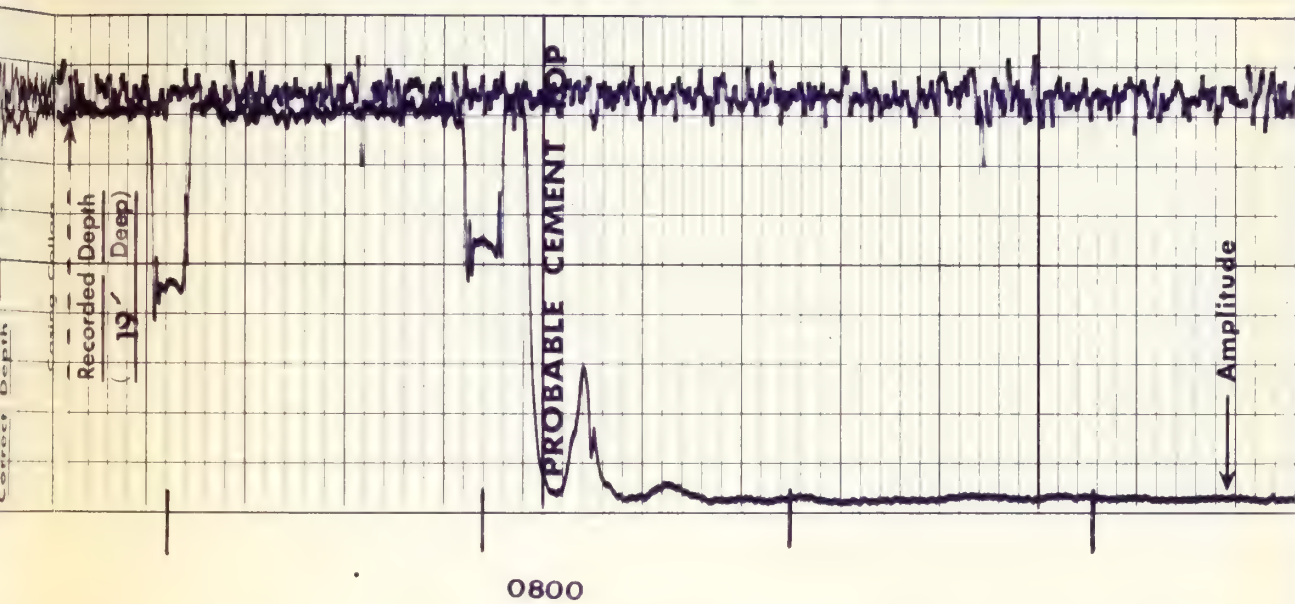
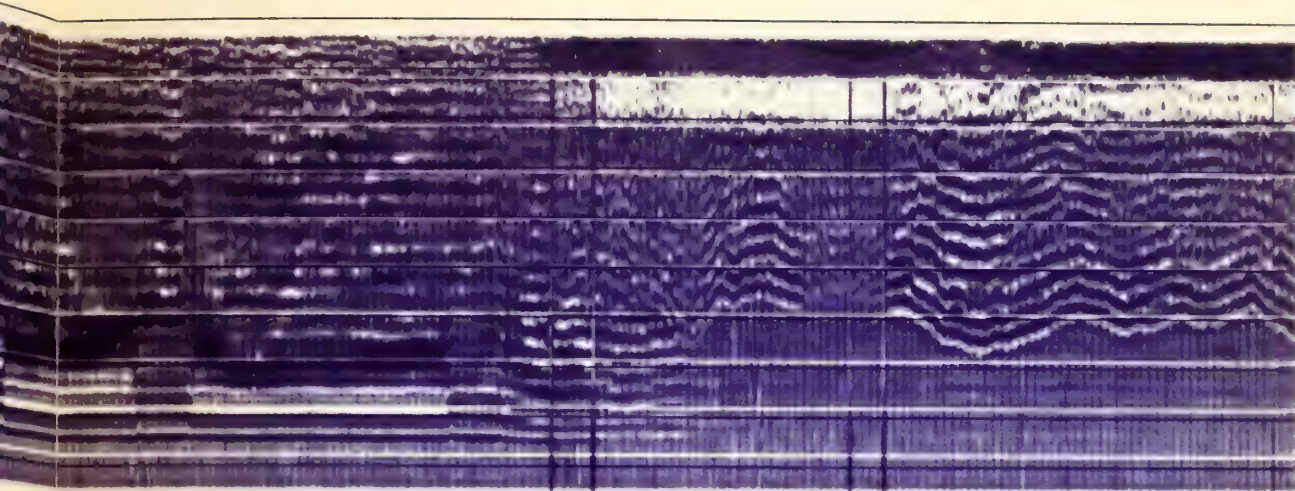
ΔI

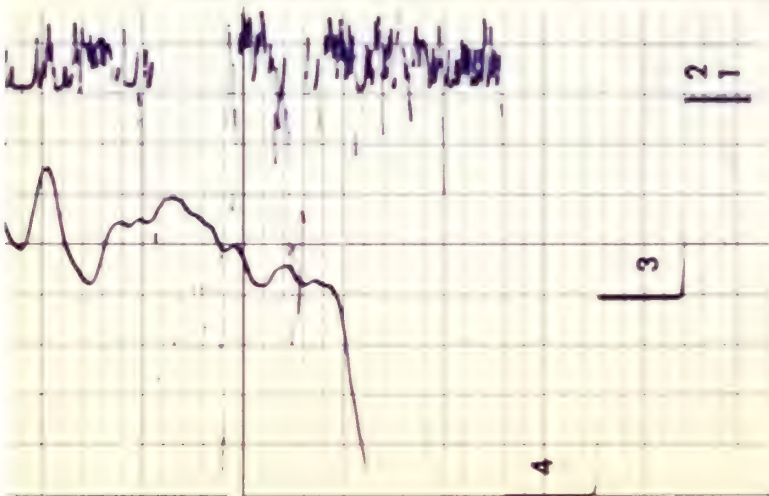
Amplitude

Casing Collars

Correct Depth

Casing Collars

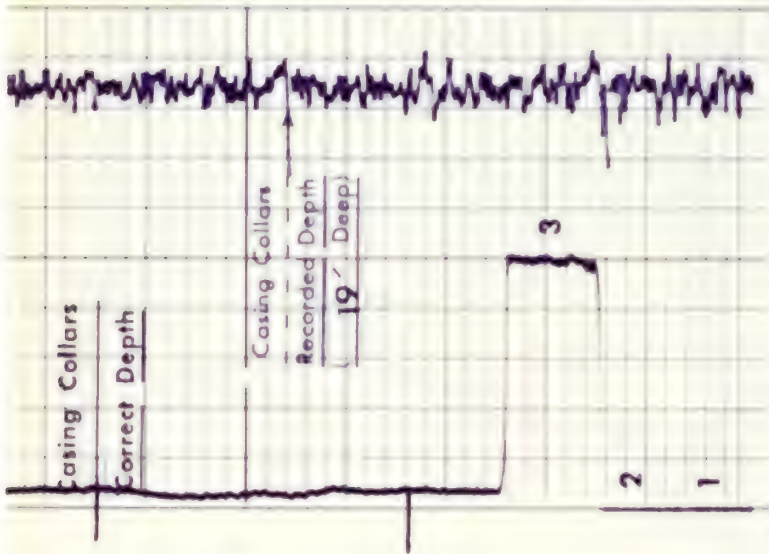




TRANSIT TIME

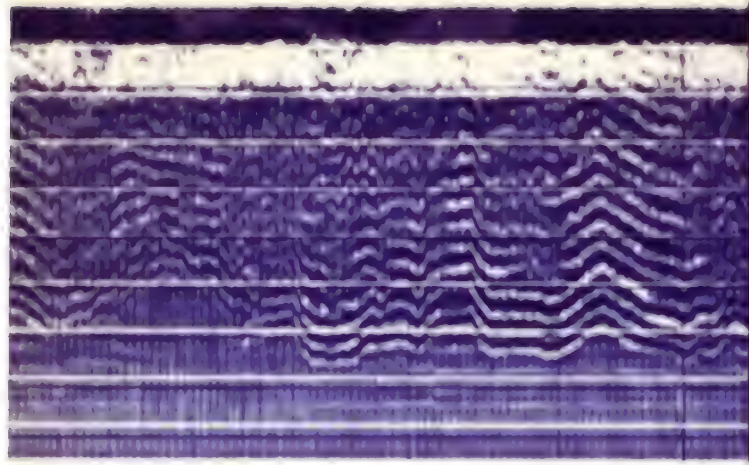
MICROSECONDS
SPACING
400 200

GAMMA RAY
API UNITS



CASING BOND

MILLIVOLTS



VARIABLE DENSITY

MICROSECONDS
5 FT. SPACING

0900

DEPTH

GROUND WATER

23

COMPANY ATLANTIC HIGHFIELD, ET AL
WELL AT-10
FIELD SORCHUA CULCHA
COUNTY RIO BLANCO STATE COLORADO

SCHL. FR 1622-1430
SCHL. TD 1630-1438
DRLR TD 1640-1441
Elev:

KB - - - - -
DF - - - - -
GL 6903

CEMENT BOND CALIBRATION CODING

| Δt | | AMPLITUDE |
|--------------------|--|-----------------|
| 1. MECHANICAL ZERO | | MECHANICAL ZERO |
| 2. 240 μ sec | | ELECTRICAL ZERO |
| 3. 320 μ sec | | CALIBRATE |
| 4. 400 μ sec | | |

5

一、二、三、四、五、六、七、八、九、十、十一、十二、十三、十四、十五、十六、十七、十八、十九、二十、二十一、二十二、二十三、二十四、二十五、二十六、二十七、二十八、二十九、三十、三十一、三十二、三十三、三十四、三十五、三十六、三十七、三十八、三十九、四十、四十一、四十二、四十三、四十四、四十五、四十六、四十七、四十八、四十九、五十、五十一、五十二、五十三、五十四、五十五、五十六、五十七、五十八、五十九、六十、六十一、六十二、六十三、六十四、六十五、六十六、六十七、六十八、六十九、七十、七十一、七十二、七十三、七十四、七十五、七十六、七十七、七十八、七十九、八十、八十一、八十二、八十三、八十四、八十五、八十六、八十七、八十八、八十九、九十、九十一、九十二、九十三、九十四、九十五、九十六、九十七、九十八、九十九、一百。

[illegible][illegible]

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 | 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 | 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 | 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 | 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 | 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 | 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 | 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2284 | 2285 | 2286 | 2287 | 2288 | 2289 | 2290 | 2291 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 | 2299 | 2300 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 | 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2320 | 2321 | 2322 | 2323 | 2324 | 2325 | 2326 | 2327 | 2328 | 2329 | 2330 | 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 | 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 | 2351 | 2352 | 2353 | 2354 | 2355 | 2356 | 2357 | 2358 | 2359 | 2360 | 2361 | 2362 | 2363 | 2364 | 2365 | 2366 | 2367 | 2368 | 2369 | 2370 | 2371 | 2372 | 2373 | 2374 | 2375 | 2376 | 2377 | 2378 | 2379 | 2380 | 2381 | 2382 | 2383 | 2384 | 2385 | 2386 | 2387 | 2388 | 2389 | 2390 | 2391 | 2392 | 2393 | 2394 | 2395 | 2396 | 2397 | 2398</ |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|

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| | | | |
|----|----|----|----|
| 姓名 | 性别 | 年龄 | 职业 |
| 姓名 | 性别 | 年龄 | 职业 |
| 姓名 | 性别 | 年龄 | 职业 |



Schlumberger

CEMENT BOND LOG

VDL/CCL

COUNTY RIO BLANCO

Field or

LOCATION

WELL CB-1

COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL CB-1

FIELD

COUNTY RIO BLANCO STATE COLORADO

LOCATION 1153' FSL & 1015' FWL

API Serial No.

Other Services:
PDC-GR
SP-HD

Sec. 1 Twp. 3S Rge. 97W

Permanent Datum: GROUND LEVEL, Elev. _____
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6760

| | | | |
|-------------------|----------|------------------|------------|
| Date | 10-16-74 | Type Drill Fluid | WATER |
| Run No. | ONE | Fluid Level | FULL |
| Depth — Driller | 1094 | Max. Rec. Temp. | ---- °F |
| Depth — Logger | 1080 | Est. Cement Top | 1400 |
| Btm. Log Interval | 1072 | Equip. Location | 362 VERNAL |
| Top Log Interval | 1060 | Recorded By | ST. AUBYN |
| Open Hole Size | 7 7/8 | Witnessed By | ELLARD |

| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom |
|----------------|-------|-------|-------|------------|------|--------|
| Surface String | | | | | | |
| Prot. String | | | | | | |
| Prod. String | 4 1/2 | 4.7 | | T-C | SURF | 2103 |
| Liner | | | | | | |

PRIMARY CEMENTING DATA

| STRING | Surface | Protection | Production | Liner |
|--------------------|---------|------------|------------|-------|
| Vol. of cement | | | 120 SRS | |
| Type of cement | | | CLASS 80 | |
| Additive | | | FACT | |
| Retarder | | | | |
| Wt. of slurry | | | | |
| Water loss | | | | |
| Type fluid in csg. | | | | |
| Fluid wt. | | | | |

The well name, location and hole data were furnished by the well owner.

DATE: 10-16-76 TIME: 10:00 AM WELL NO: 10-16-76 CEMENT TYPE: 10-16-76

PRIMARY CEMENTING PROCEDURE

REMARKS

Hours from start
of operation

Service Order No. 10-16-76
Csg. Collars Recorded 1 ft.

Hour - date

Started pumping cement 10-20 9-20-76
Release pressure 11-22 9-20-76
Start Cement Bond Log 12-00 10-16-76
Finish Cement Bond Log 1-15 10-16-76

Preceding fluid
Cement pumped Volume bbls./minute bbls.

Pipe reciprocated during Pumping: Yes No
Pipe reciprocated after plug down: Yes min. No

SQUEEZE JOB DETAIL

EQUIPMENT DATA

Centralizer
Depths

Scratcher
Depths

Squeeze number 1 2

Sonic Panel No.

Sonic Cart No.

Sonic Sonde No.

CRP No.

Mem Panel No.

GR Panel No.

GR Cart No.

Centralizer: Type No.

To Level (MV)

Cart. Gain

CRP Intensity

R9G Intensity

Logging Speed

Time Constant

Breakdown pressure

Max. pressure-stage 1

" " 2

" " 3

Final maximum pressure

Started pumping cement

Released pressure

Start CBL

Finish CBL

AVERAGE WELL DRIFT:

from to

from to

from to

from to

CASING BOND

VARIABLE DENSITY

TRANSIT TIME

MICROSECONDS _____ SPACING _____
400 _____ 200 _____

GAMMA RAY

API UNITS

DEPTH

CASING BOND

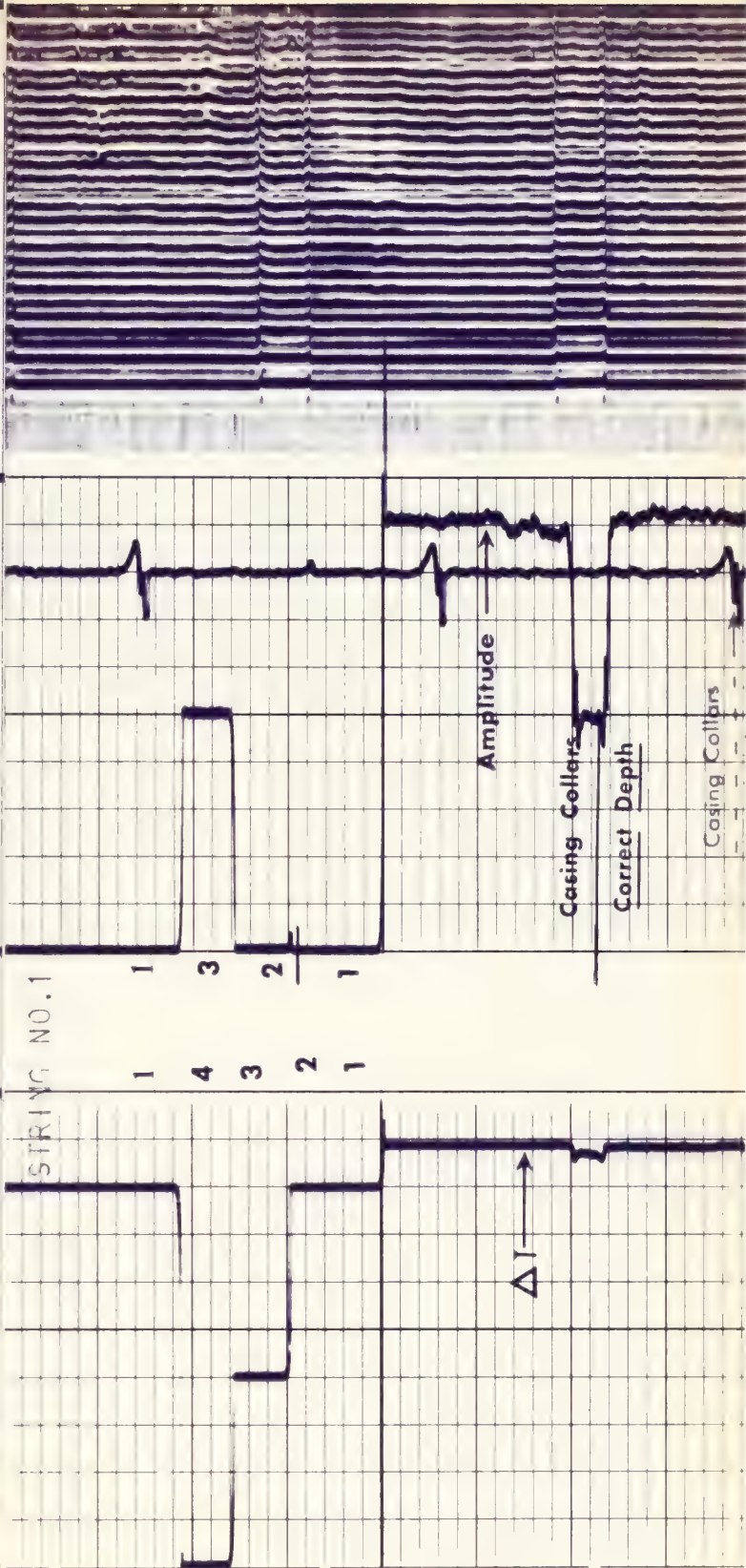
MILLIVOLTS _____
0 _____ 100 _____

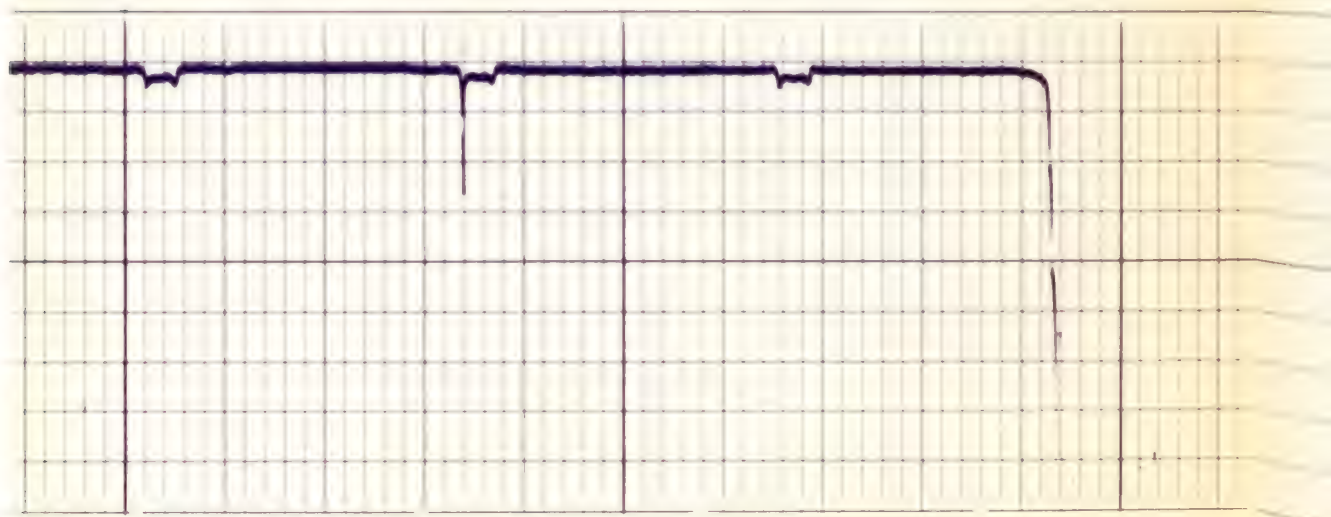
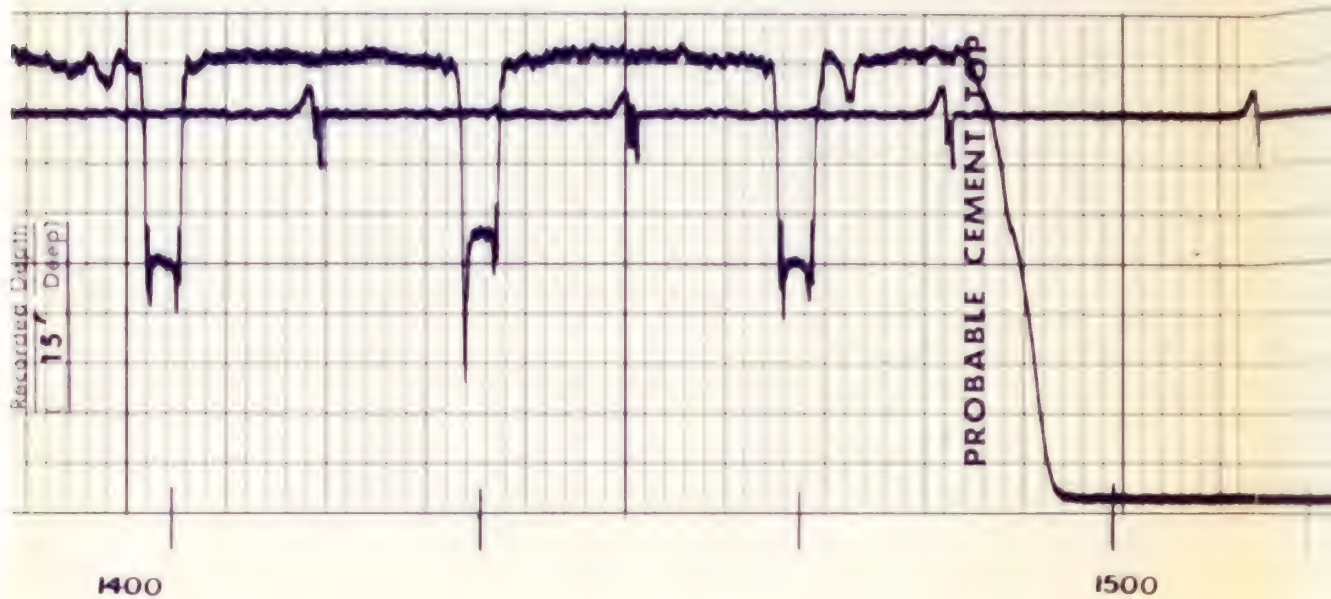
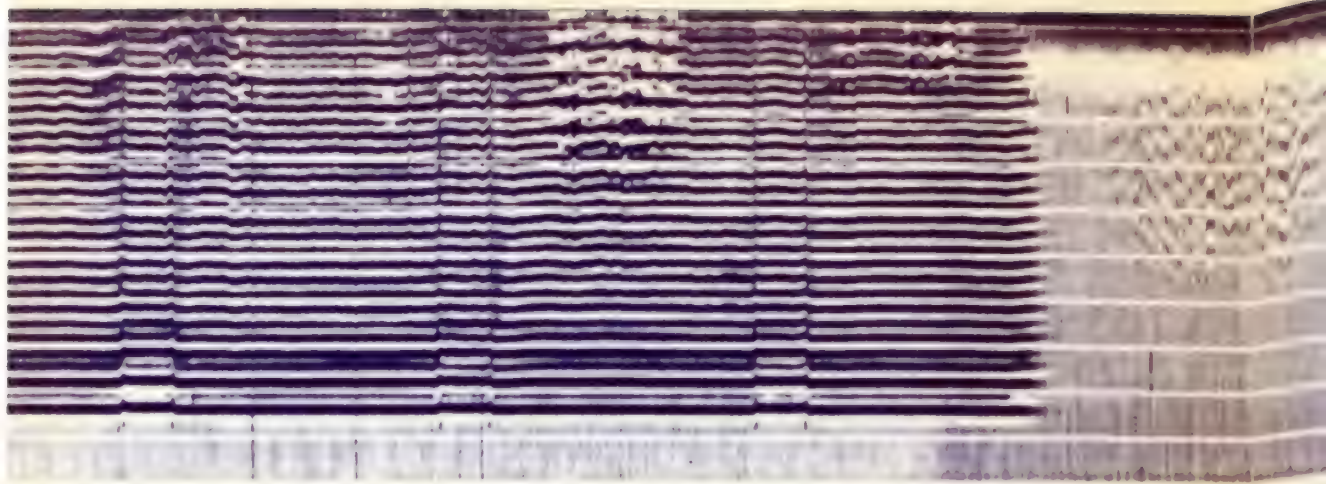
VARIABLE DENSITY

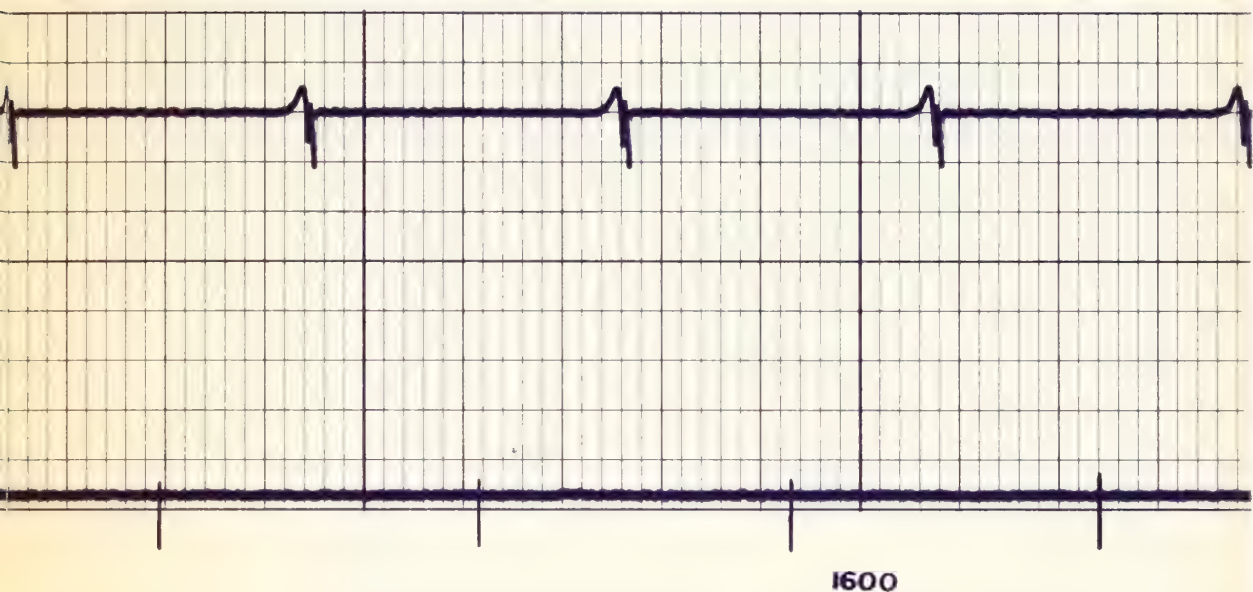
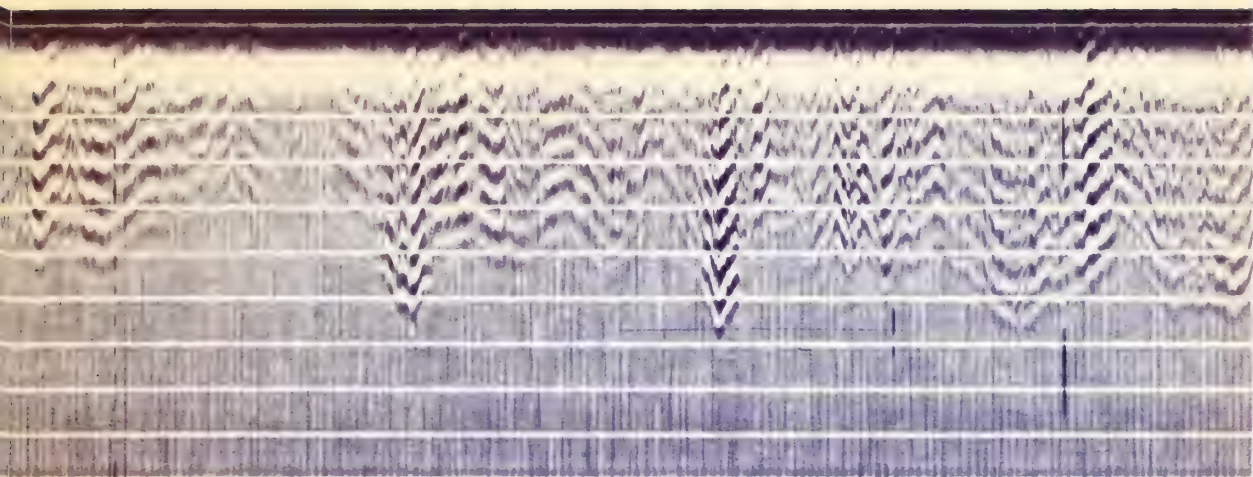
MICROSECONDS _____ SPACING _____
100 _____ 1000 _____

Casing Collars
Corrected Depth

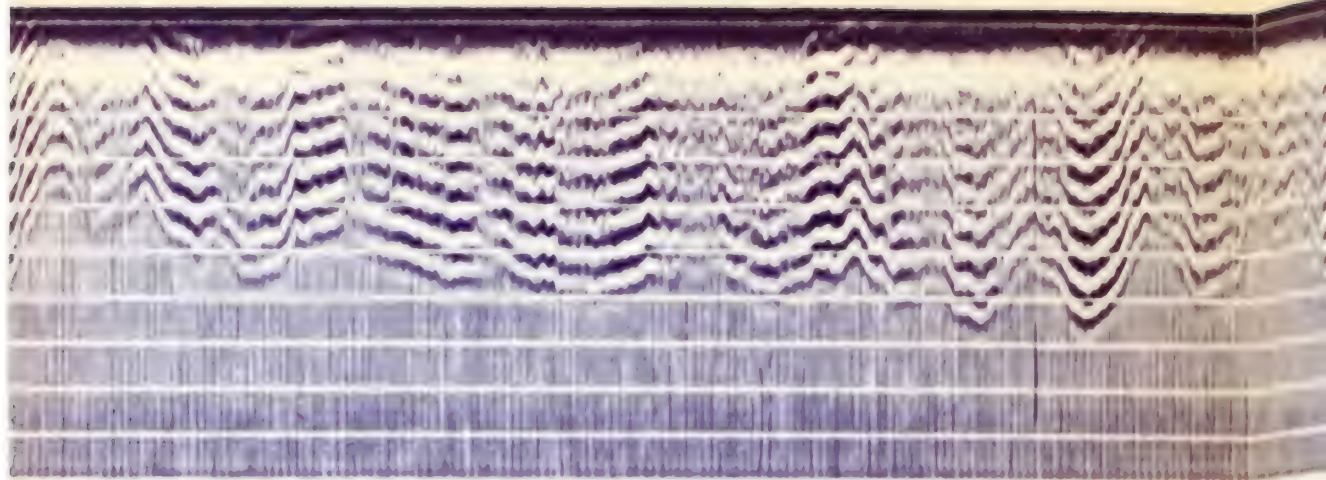
STRING NO. 1



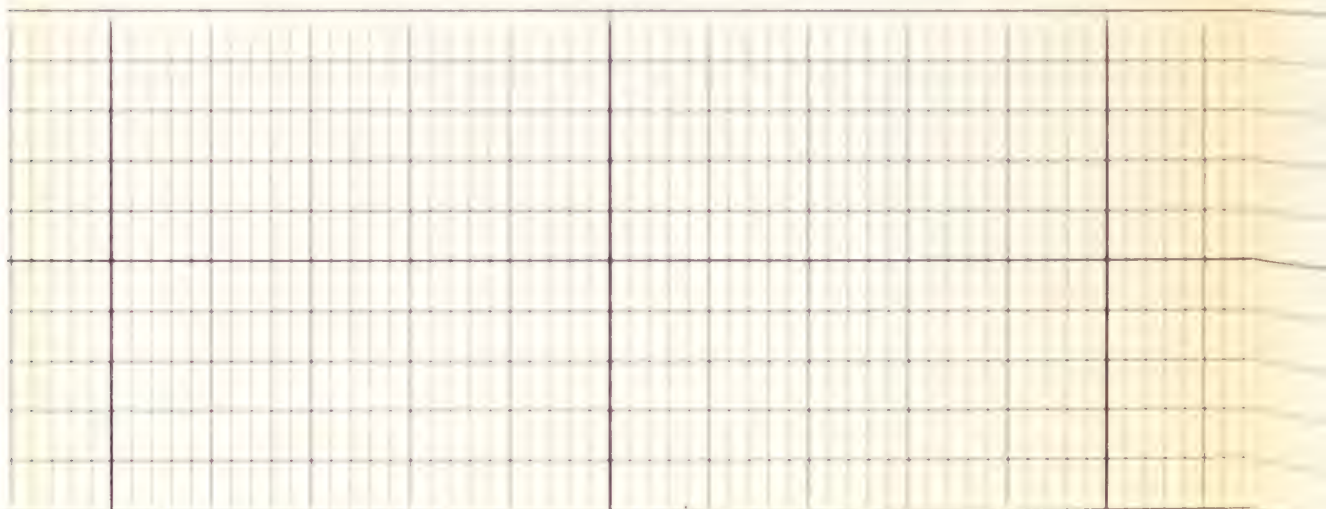


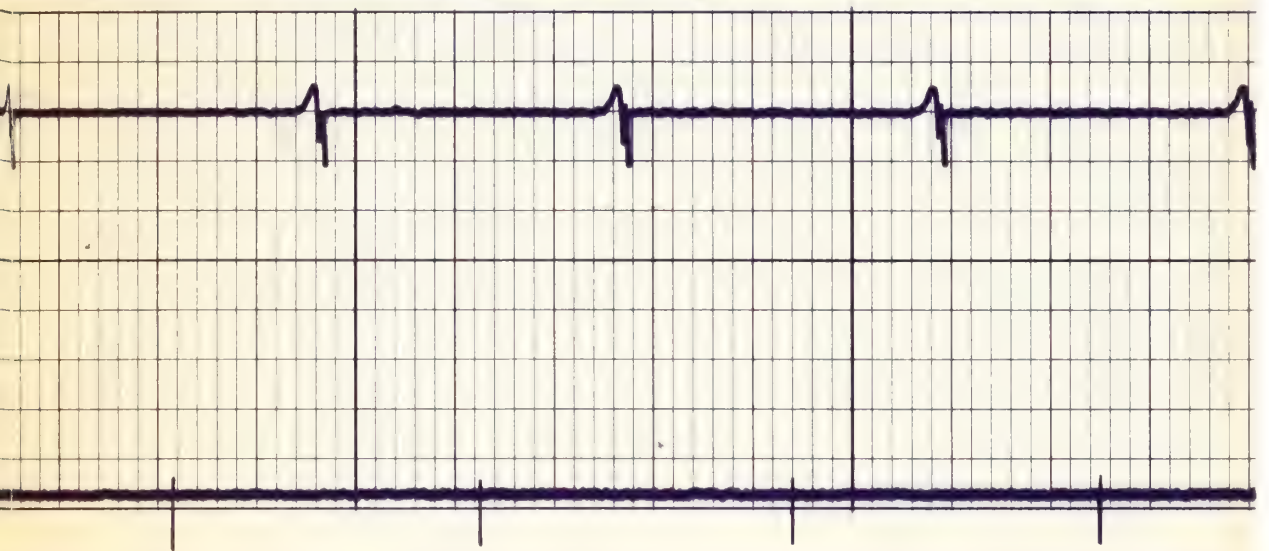
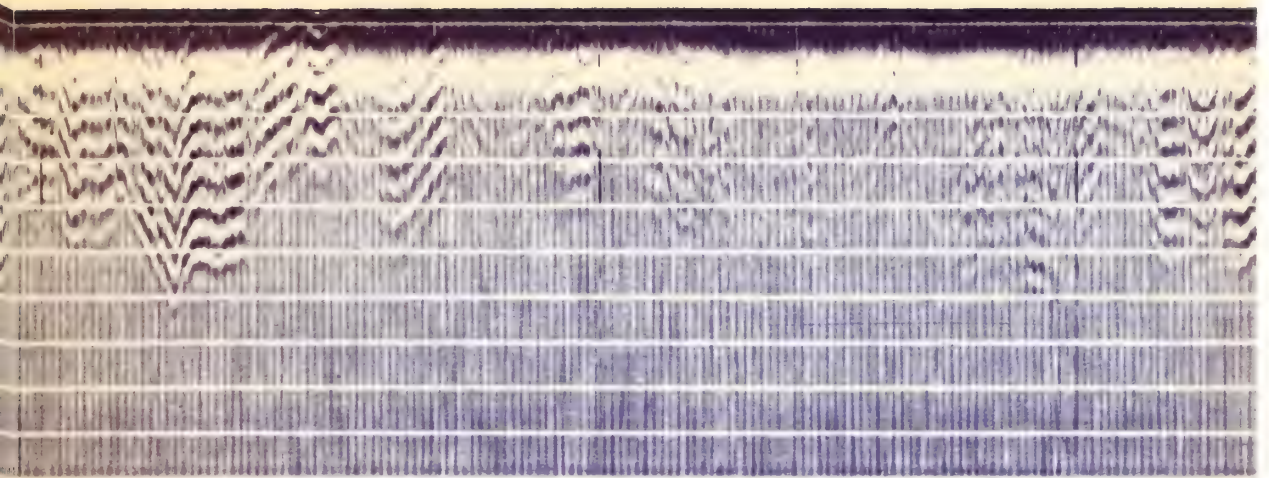


INDICATED INTERVAL
OF BALLS OF SHOT
AT 1000 YDS WITH
1 1/2 IN. DIAPHRAGM

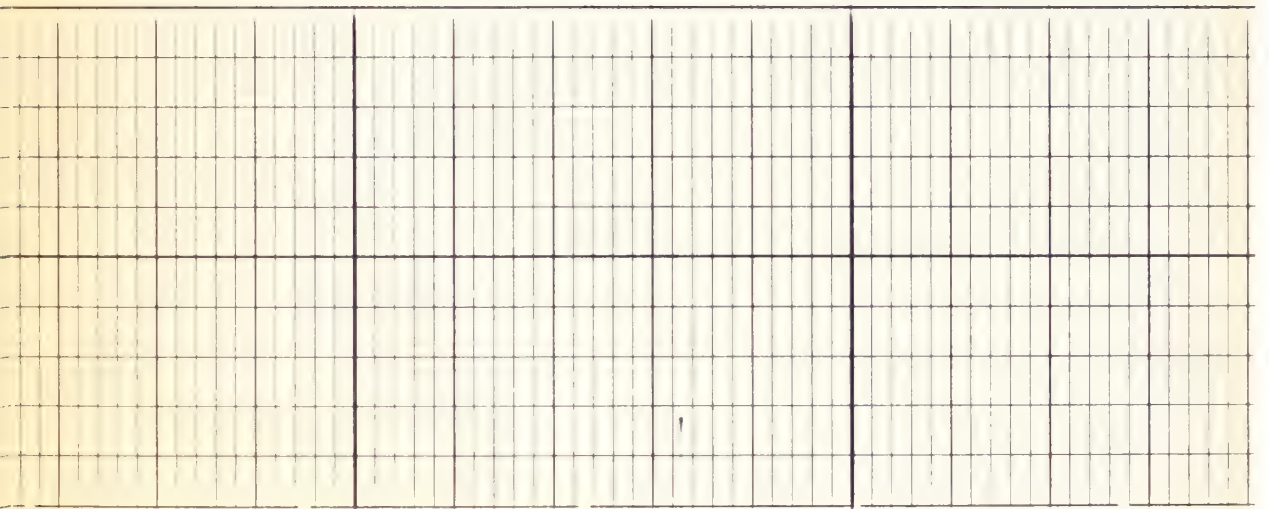


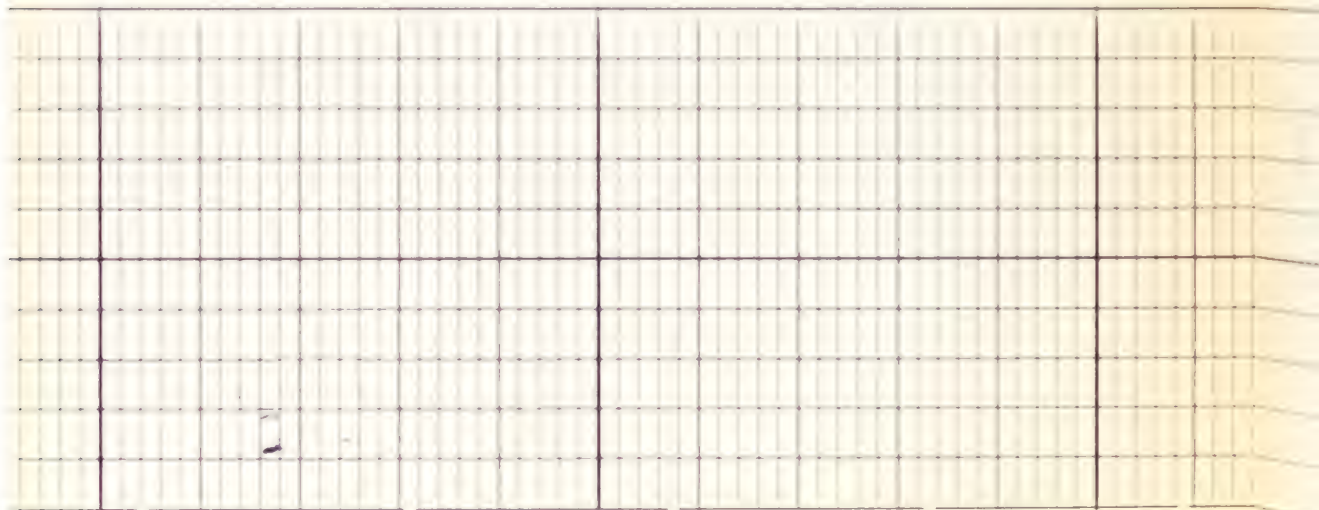
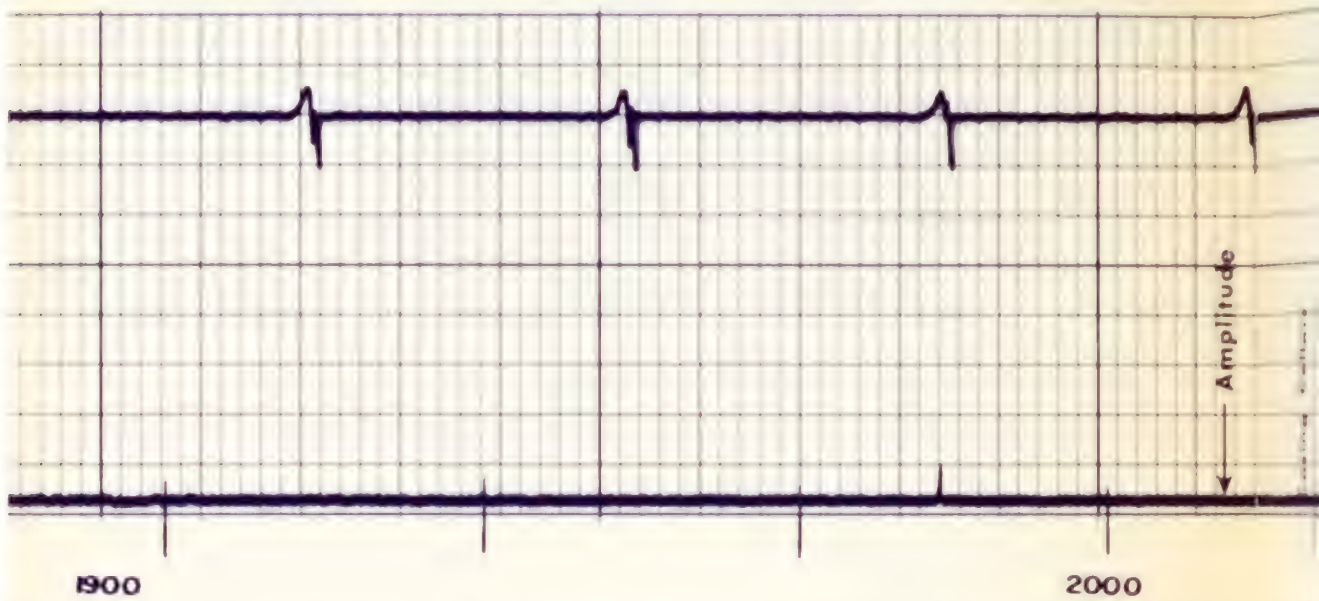
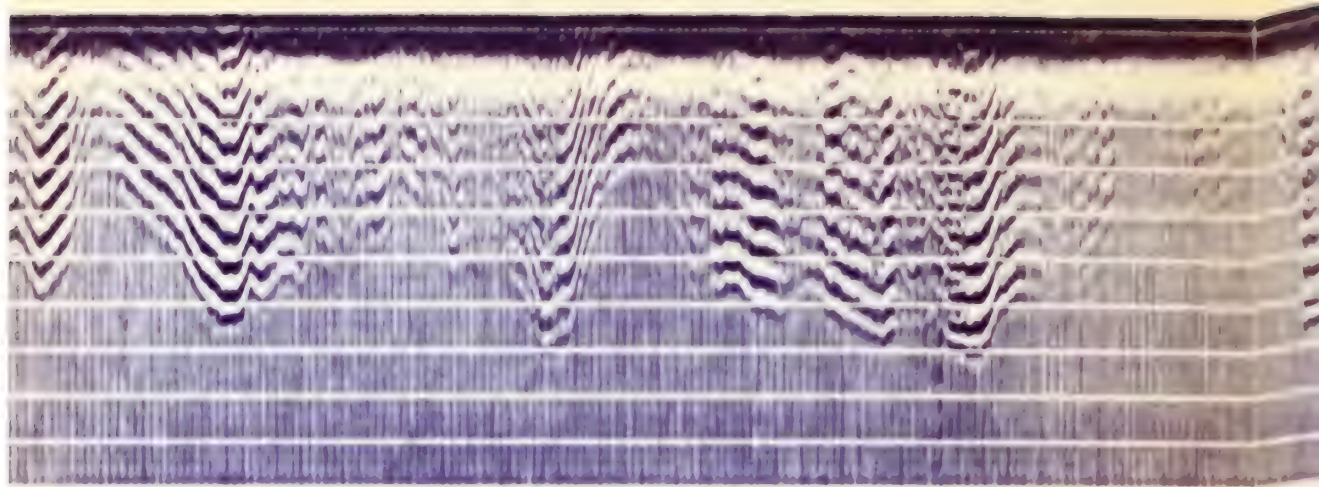
1700

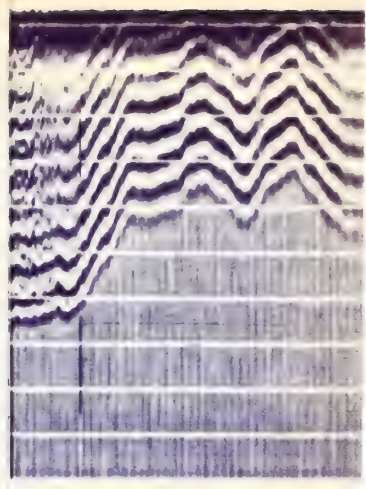
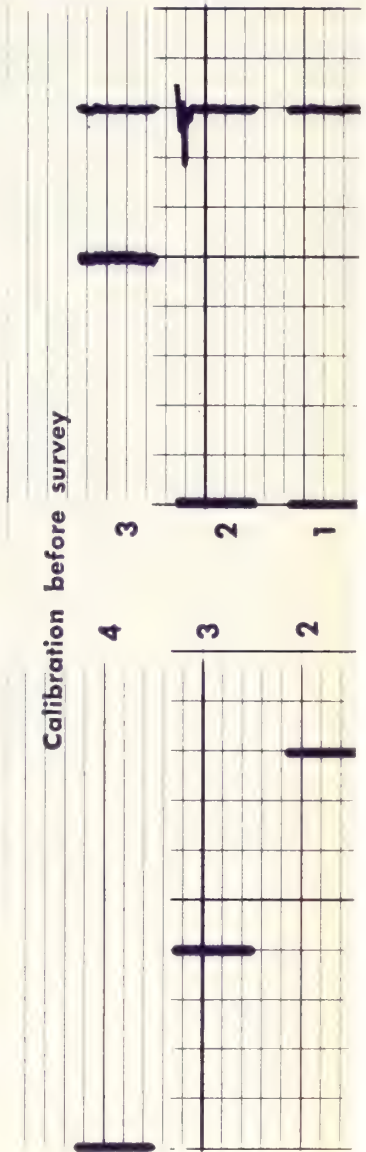
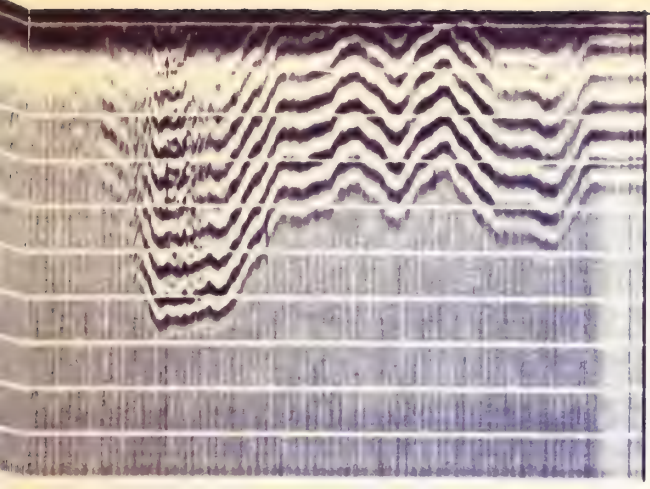
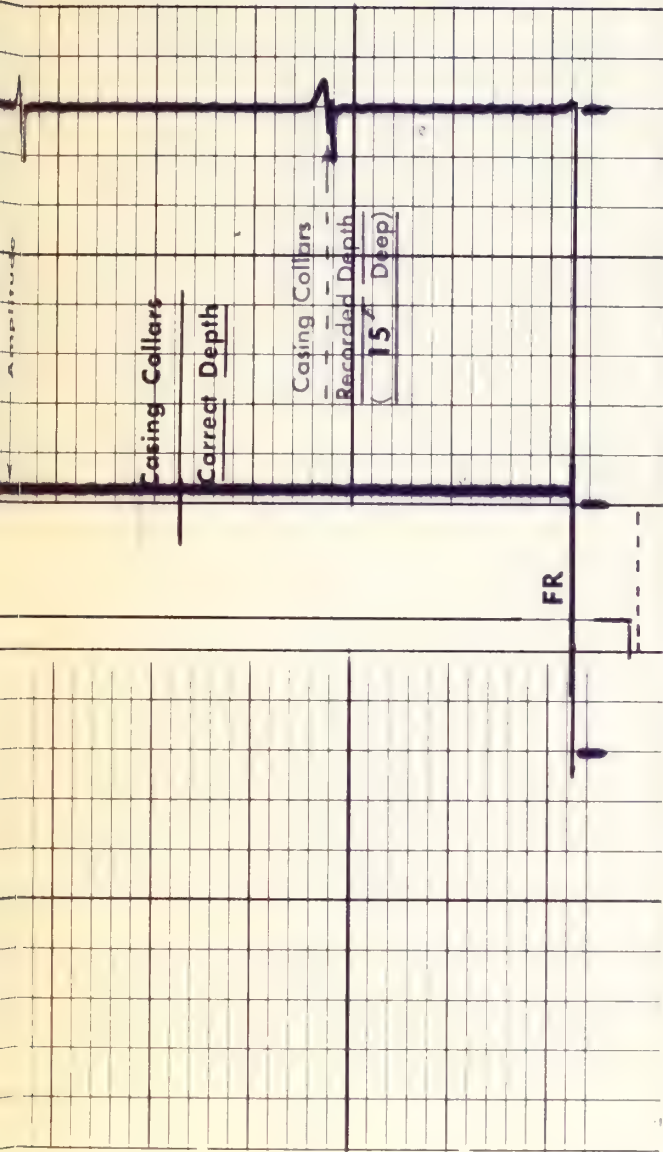




1800







REPEAT SECTION

calibration after Survey

1 4 3 2 1

1 3 2 1

ΔT

Amplitude

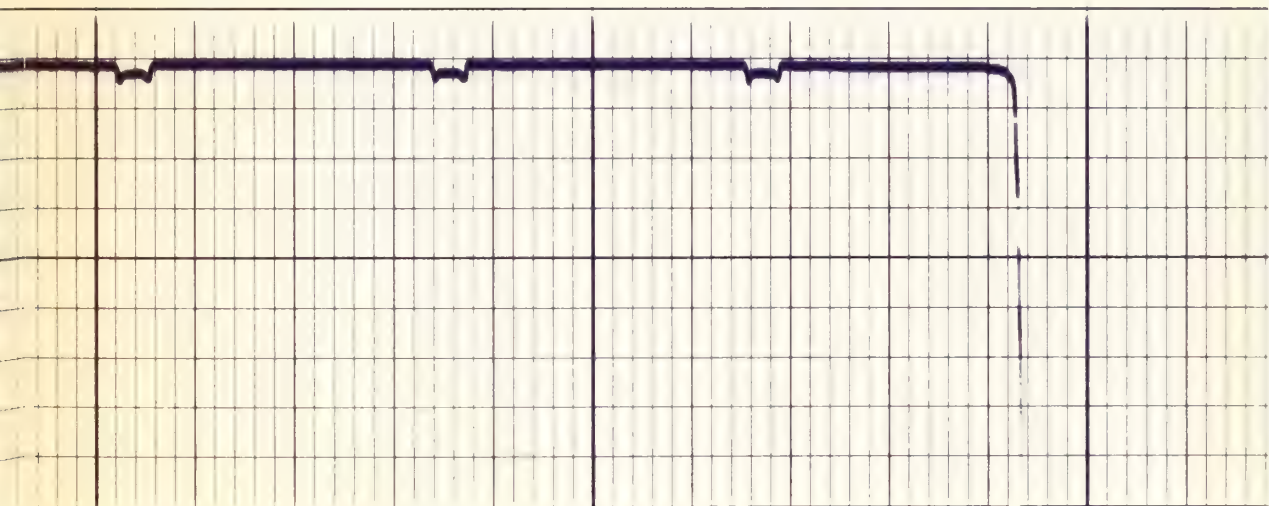
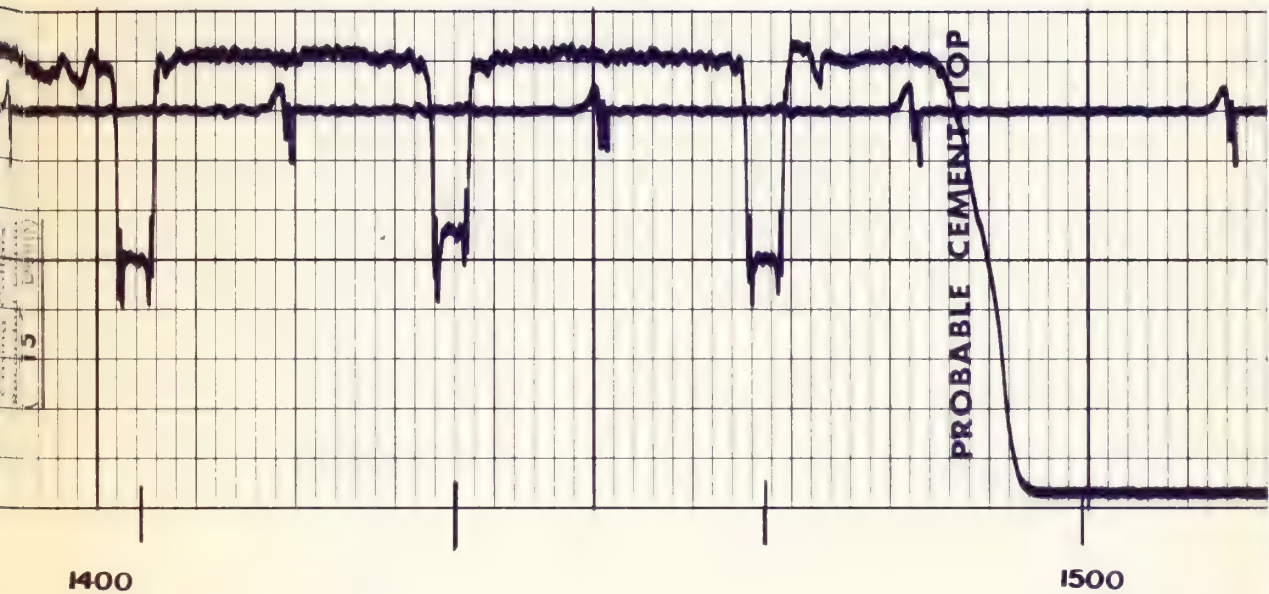
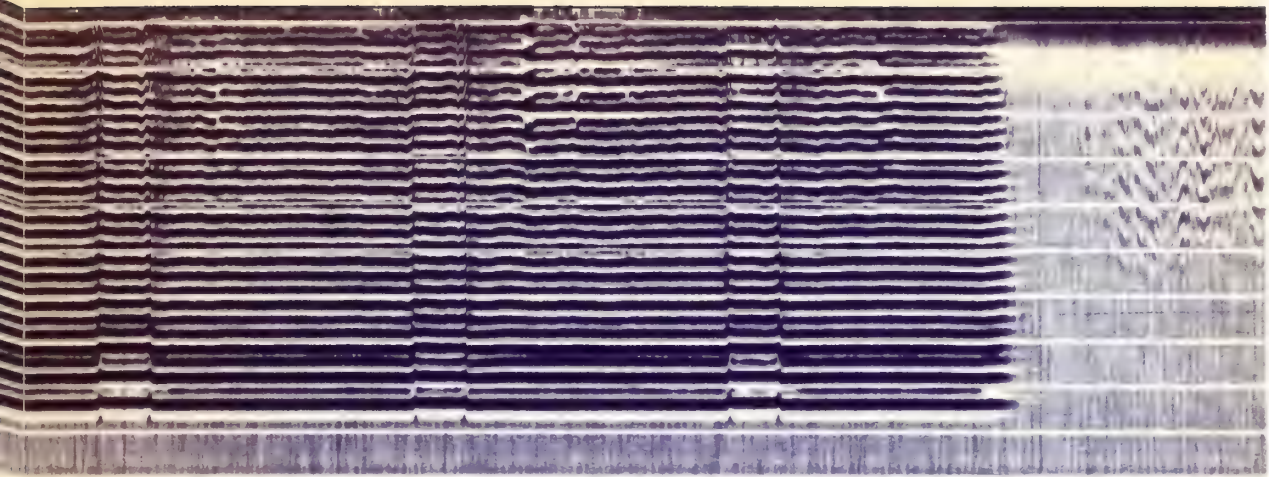
Casing Collars

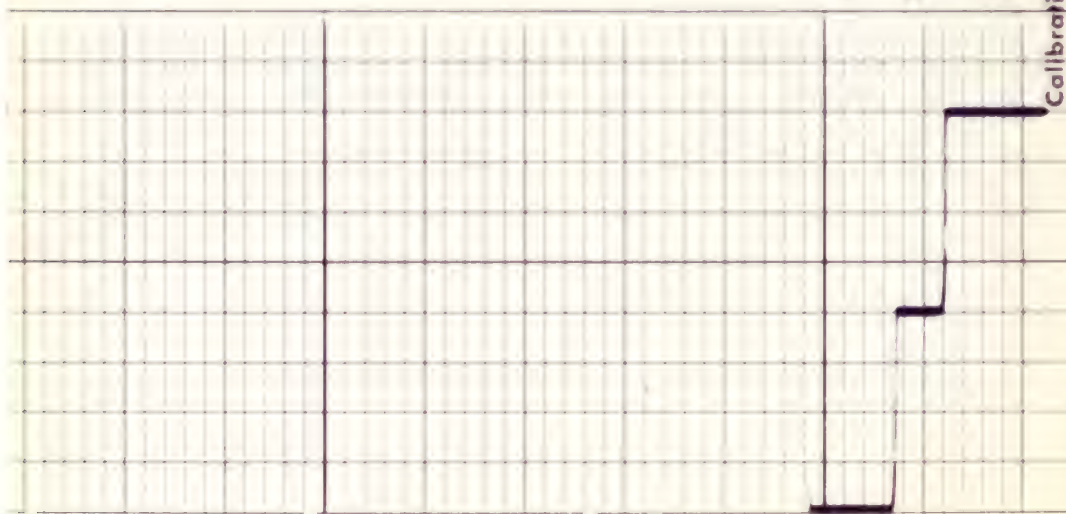
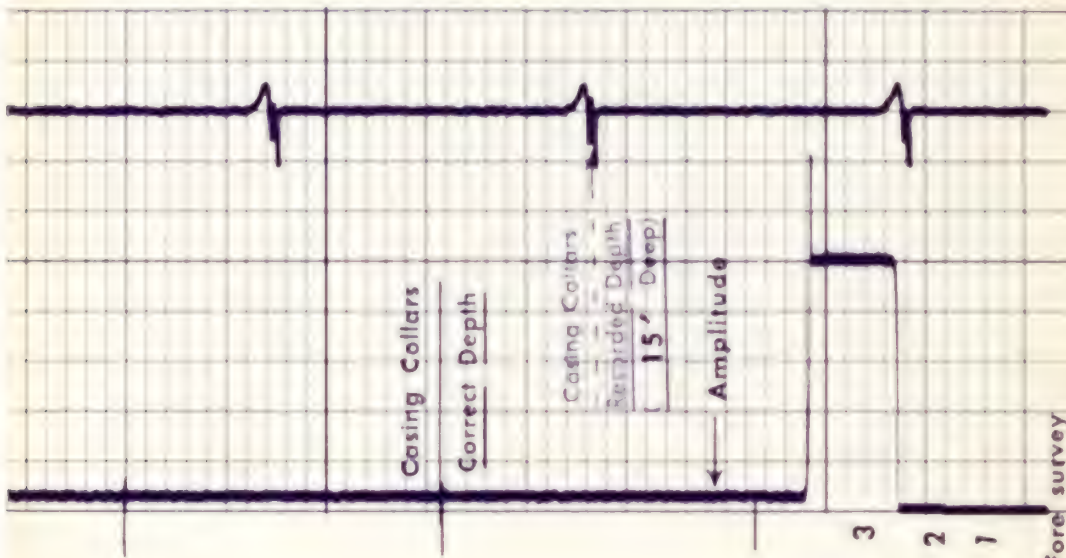
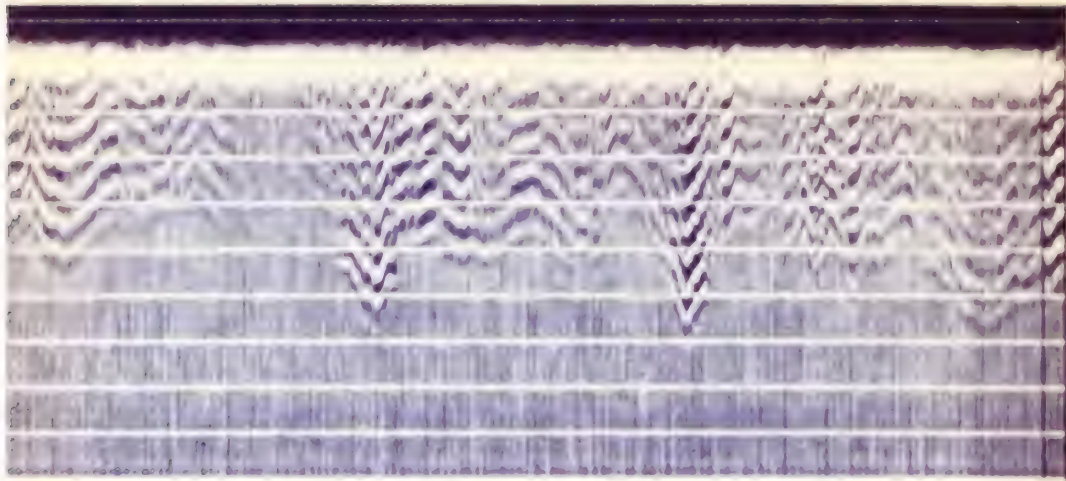
Correct Depth

Casing Collars

Recorded Depth

100





| TRANSCIT TIME | CASING BOND | VARIABLE DENSITY |
|---------------|--|------------------|
| | <div data-bbox="1207 882 1275 1058">Casing Collars Corrected Depth</div> | |

| | | | | | |
|---|--|---|-------------------------------|--|--|
| TRANSIT TIME MICROSECONDS _____ SPACING _____ 400 _____ 200 _____ | | CASING BOND MILLIVOLTS _____ 0 _____ 1 _____ | | VARIABLE DENSITY MICROSECONDS _____ SPACING _____ 200 _____ 100 _____ | |
| GAMMA RAY API UNITS _____ _____ _____ | | | DEPTH _____ _____ _____ | | |
| COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> WELL <u>C-1</u> FIELD _____ COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> SCHL. FR <u>2072</u> SCHL. TD <u>2080</u> DRLR TD <u>2094</u> Elev: _____ KB _____ DF _____ GL _____ | | | | | |

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Schlumberger

CASING COLLAR LOG AND PERFORATING RECORD

COUNTY RIO BLANCO
FIELD or LOCATION CB-1
WELL CB-1
COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL CB-1

FIELD

COUNTY RIO BLANCO STATE COLORADO

Location: FSL & 10151 FWL

Other Services:

PDC-GP
CP-410

Sec. 1 Twp. 35 Rge. 9W

Permanent Datum: GROUND LEVEL; Elev.: 5760
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B.
D.F.
G.L. 5760

Date 10-17, 18, 19-74

Run No. ONE

PLUG BACK TOTAL DEPTH 2094 DRILLER- 2094 LOGGER- 2000

DEPTHS BELOW RELATE TO: OPEN HOLE LOG MEASUREMENTS: ☐

: RADIOACTIVITY LOG MEASUREMENTS: ☒

: SCHLUMBERGER LINE MEASUREMENTS: ☐

CASING COLLARS

PERFORATING DATA

| | | No. Shots | From | To | Gun Type | Gun Size |
|------|------|-----------|------|------|-----------|----------|
| 1775 | 1900 | 240 | 1540 | 2070 | HYPERDOME | 1 11/16" |
| 1739 | 1900 | | | | | |
| 1711 | 1900 | | | | | |
| 1675 | 2000 | | | | | |
| 1920 | 2000 | | | | | |

BORE HOLE RECORD

CASING RECORD

| Hole Size | From | To | Size | Type | Weight | From | To |
|-----------|------|----|------|------|--------|------|----|
| 7" | 0.0 | 1 | 3/8 | | 4.7 | 0.0 | 10 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

HOLE FLUID DATA

Opr. Rig Time: 4 HOURS
Truck No. 5002
Location: VERNA
Recorded By: ST. AUGUST
Witnessed By: MR. ELLIARD

Type Fluid: WATER
Density:
Fluid Level: F

The well name, location and borehole reference data were furnished by the customer.

FOI D HERE

REMARKS

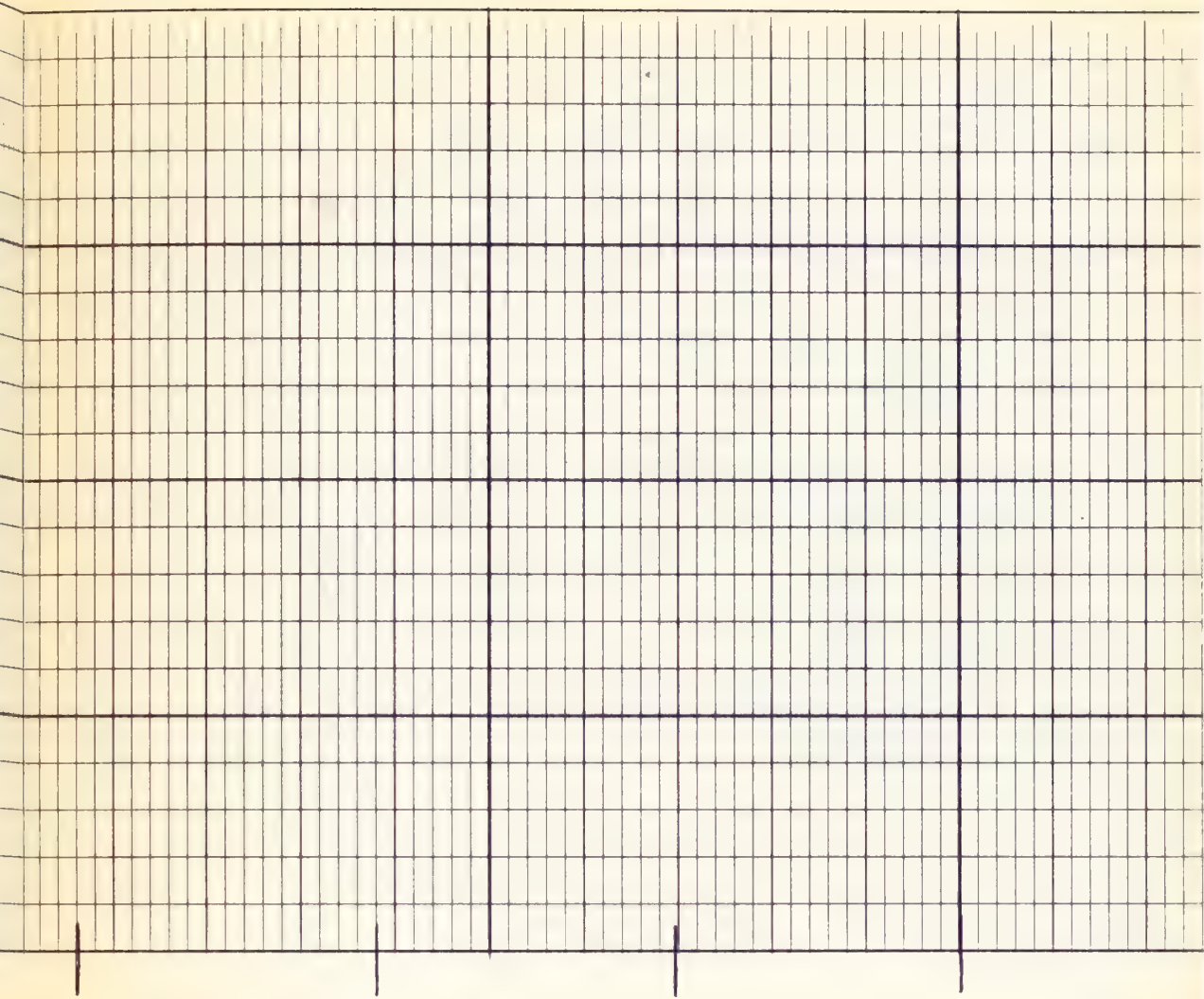
API Serial No.

Service Order No.

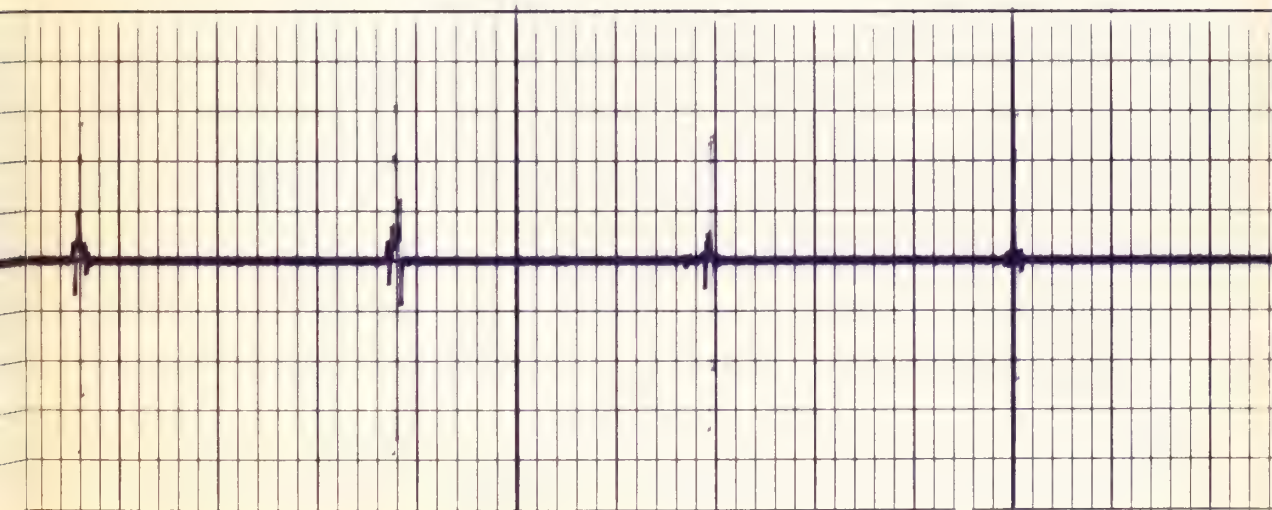
CASING COLLAR LOG
BEFORE PERFORATION

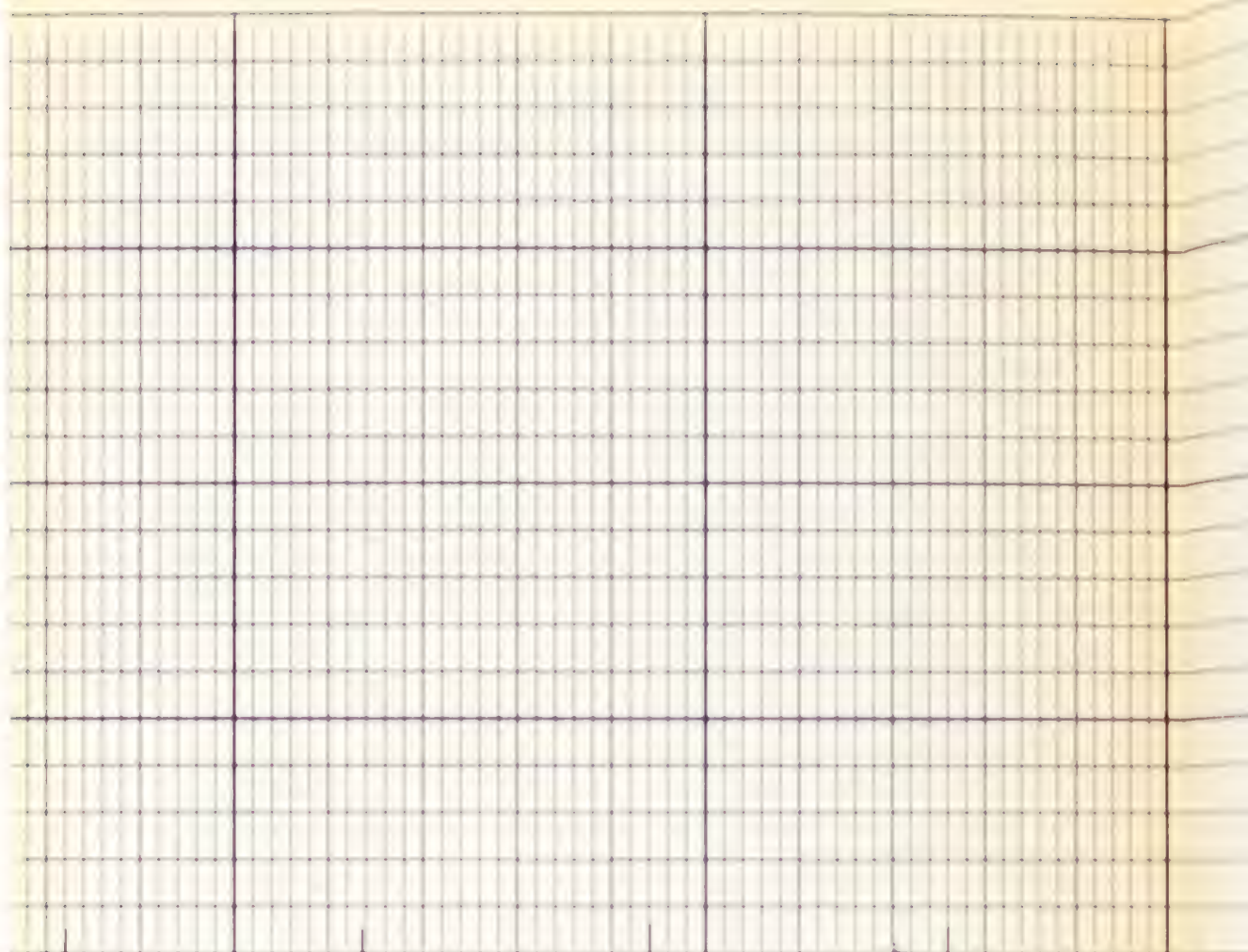
DEPTHS

1000



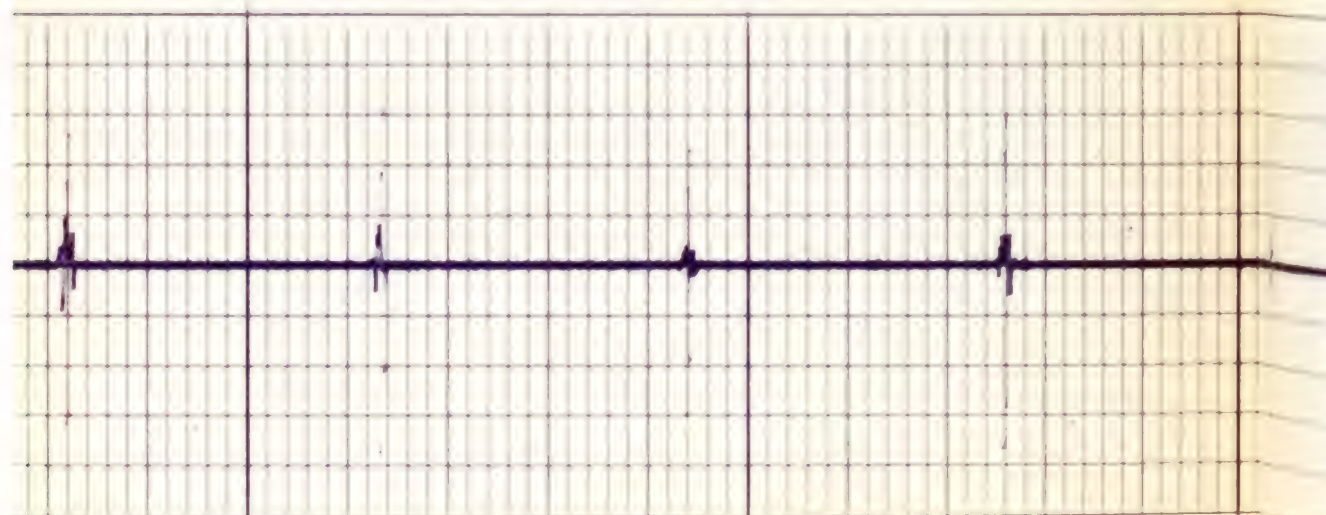
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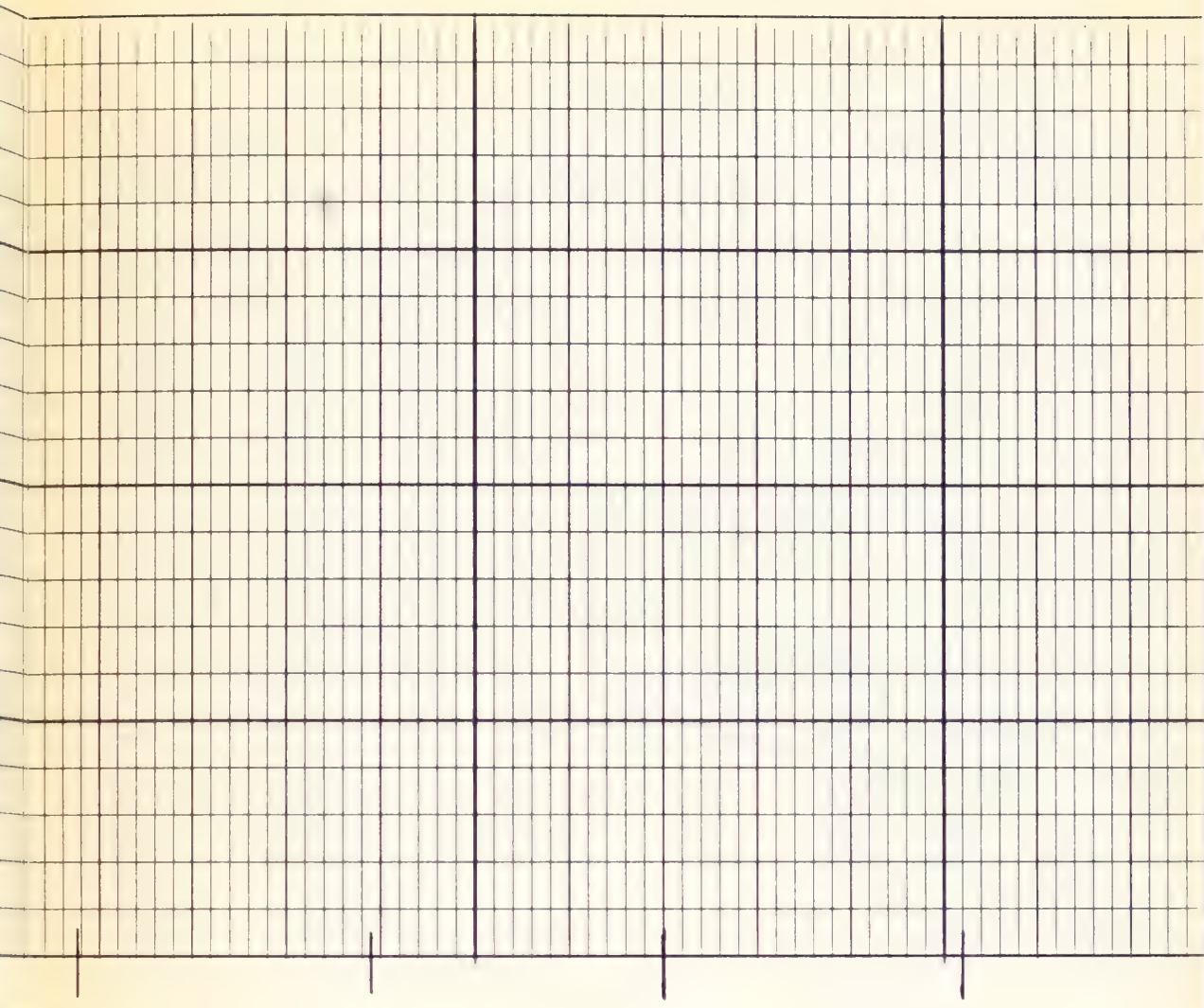




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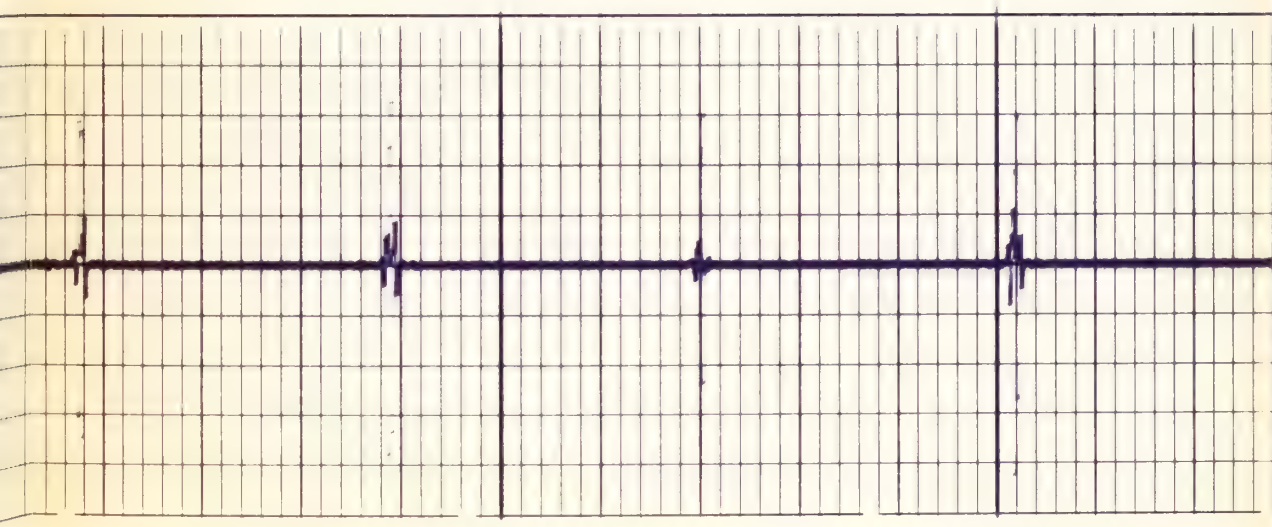
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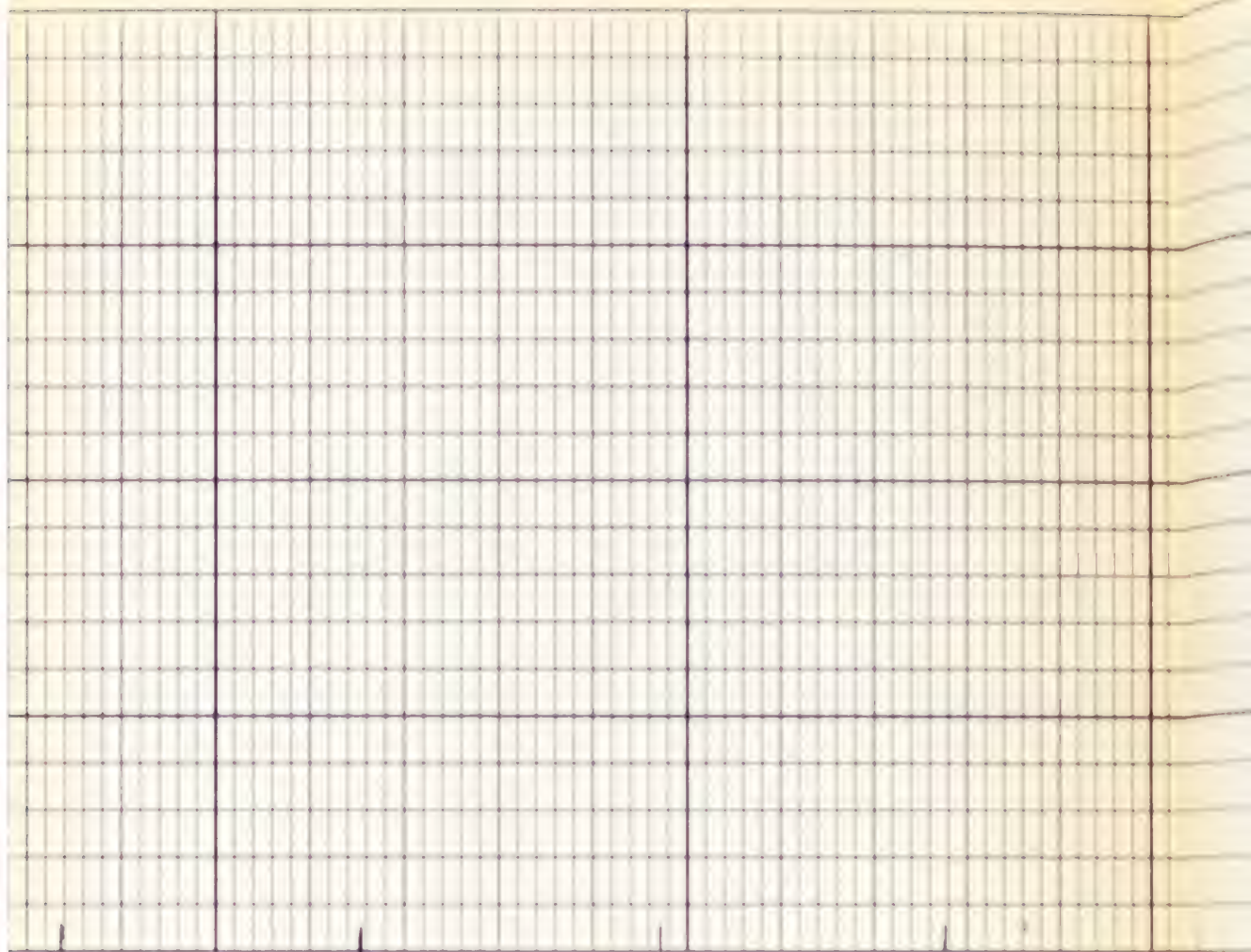




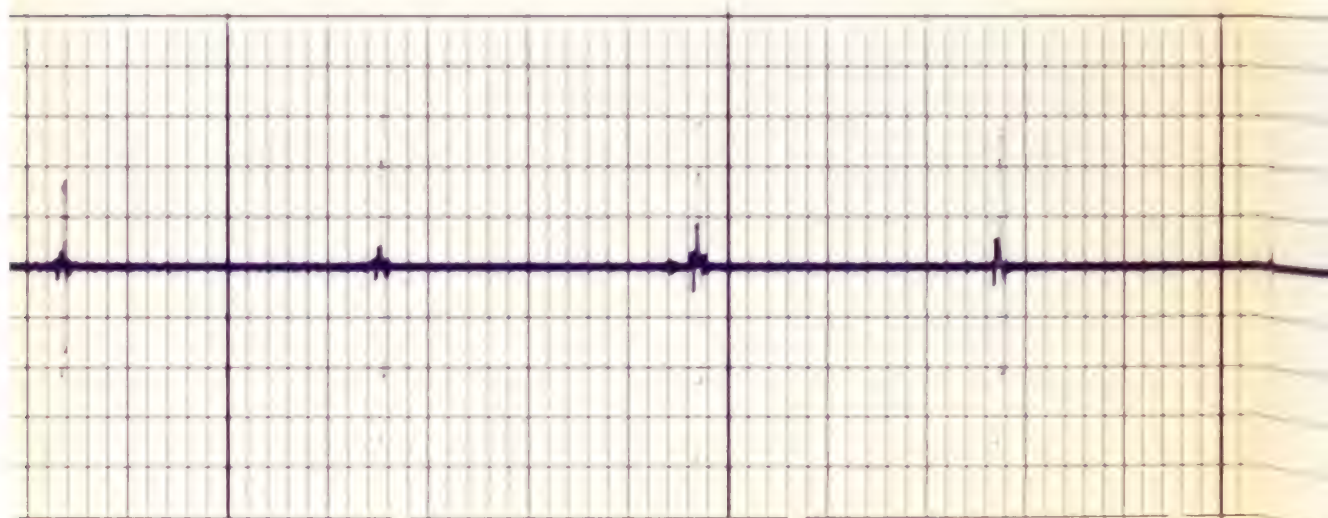
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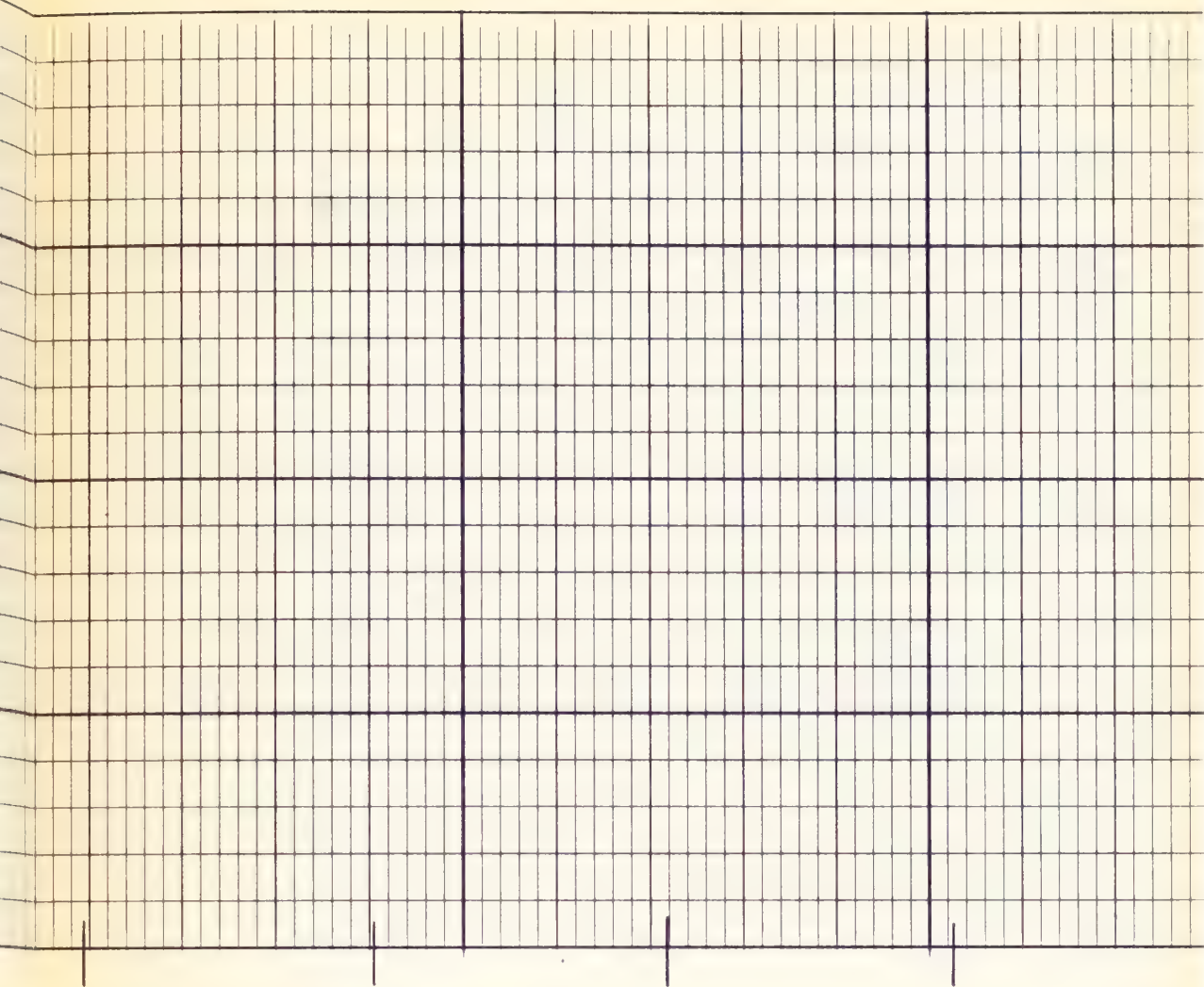
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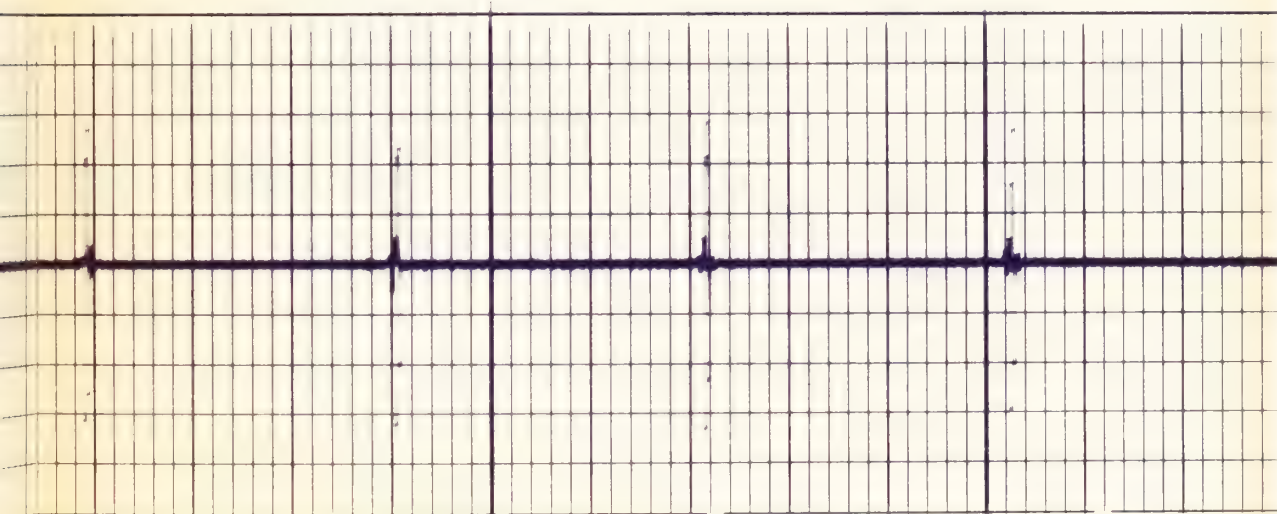


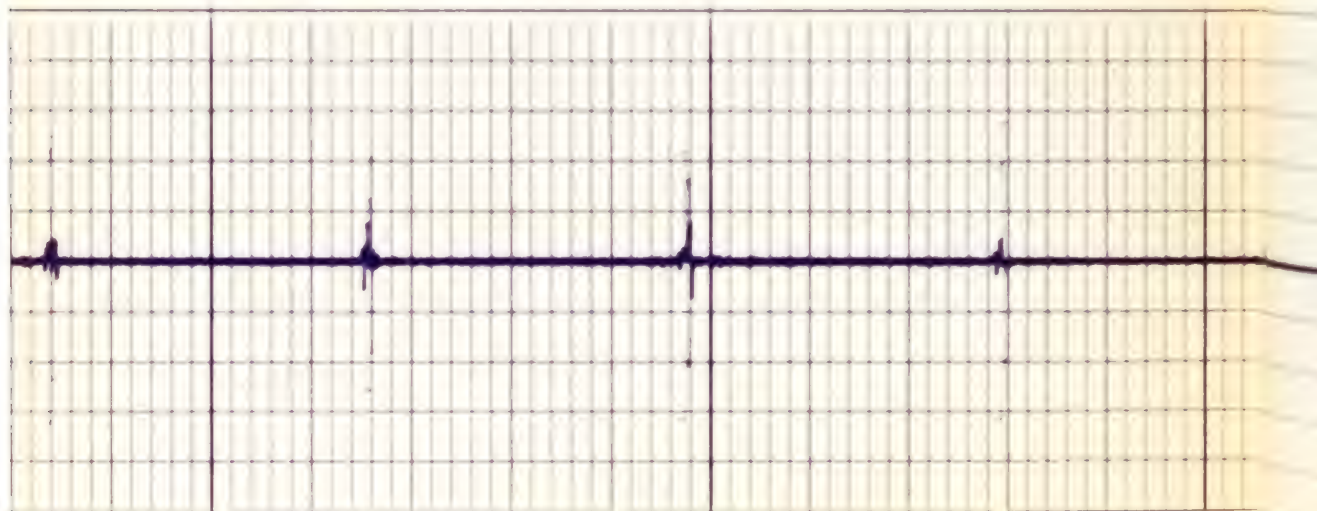
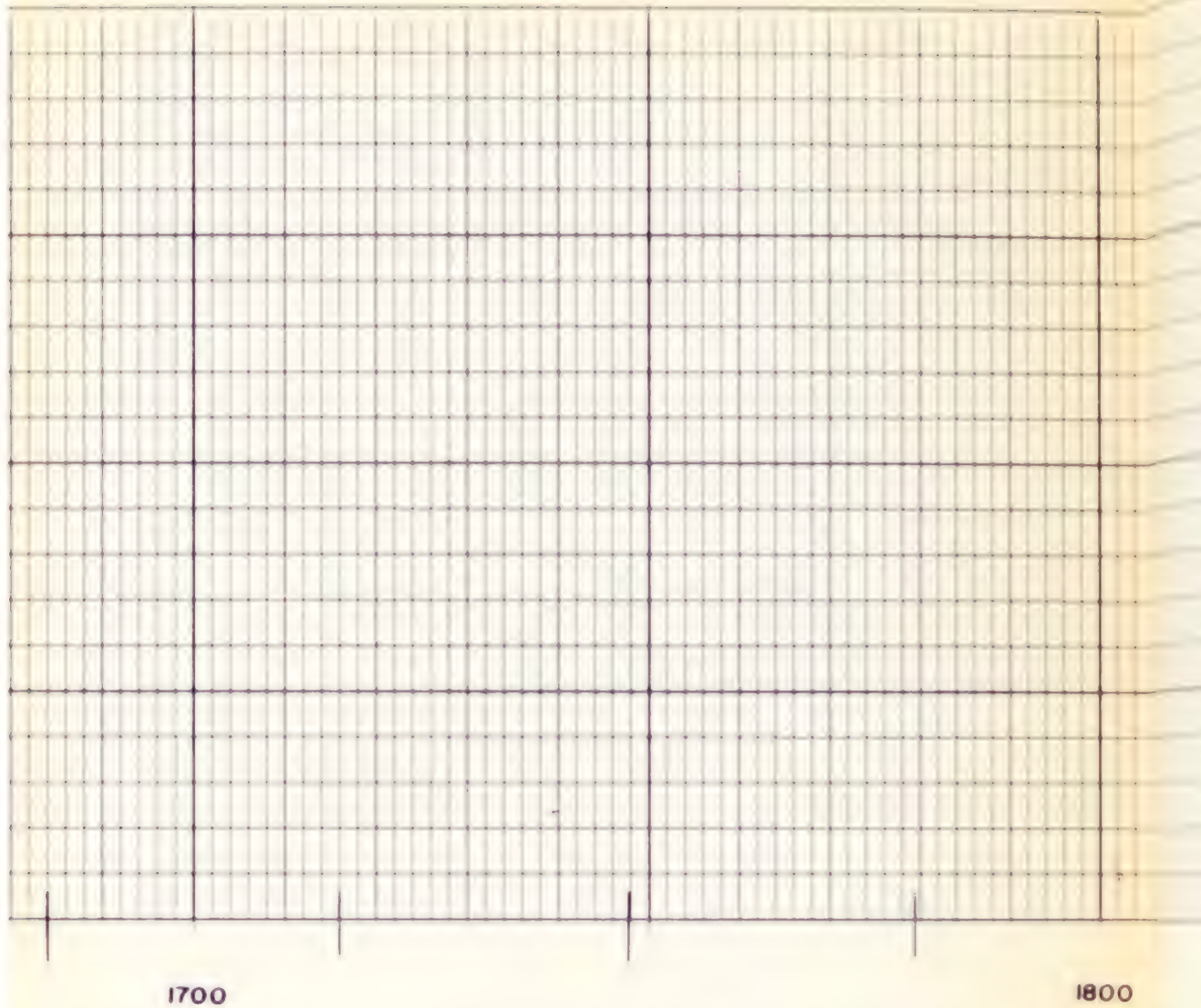
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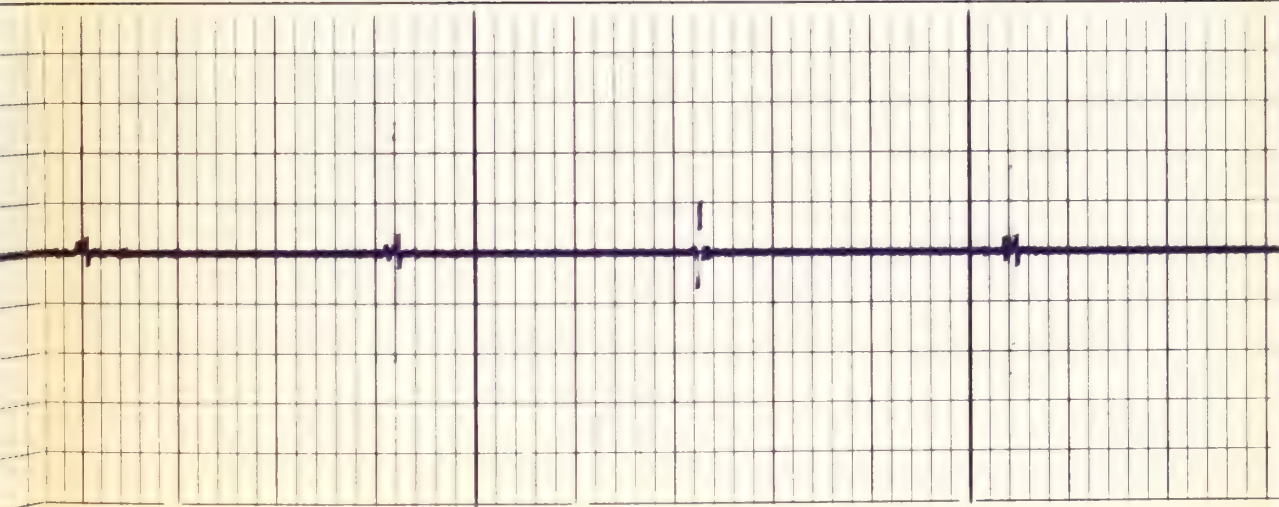
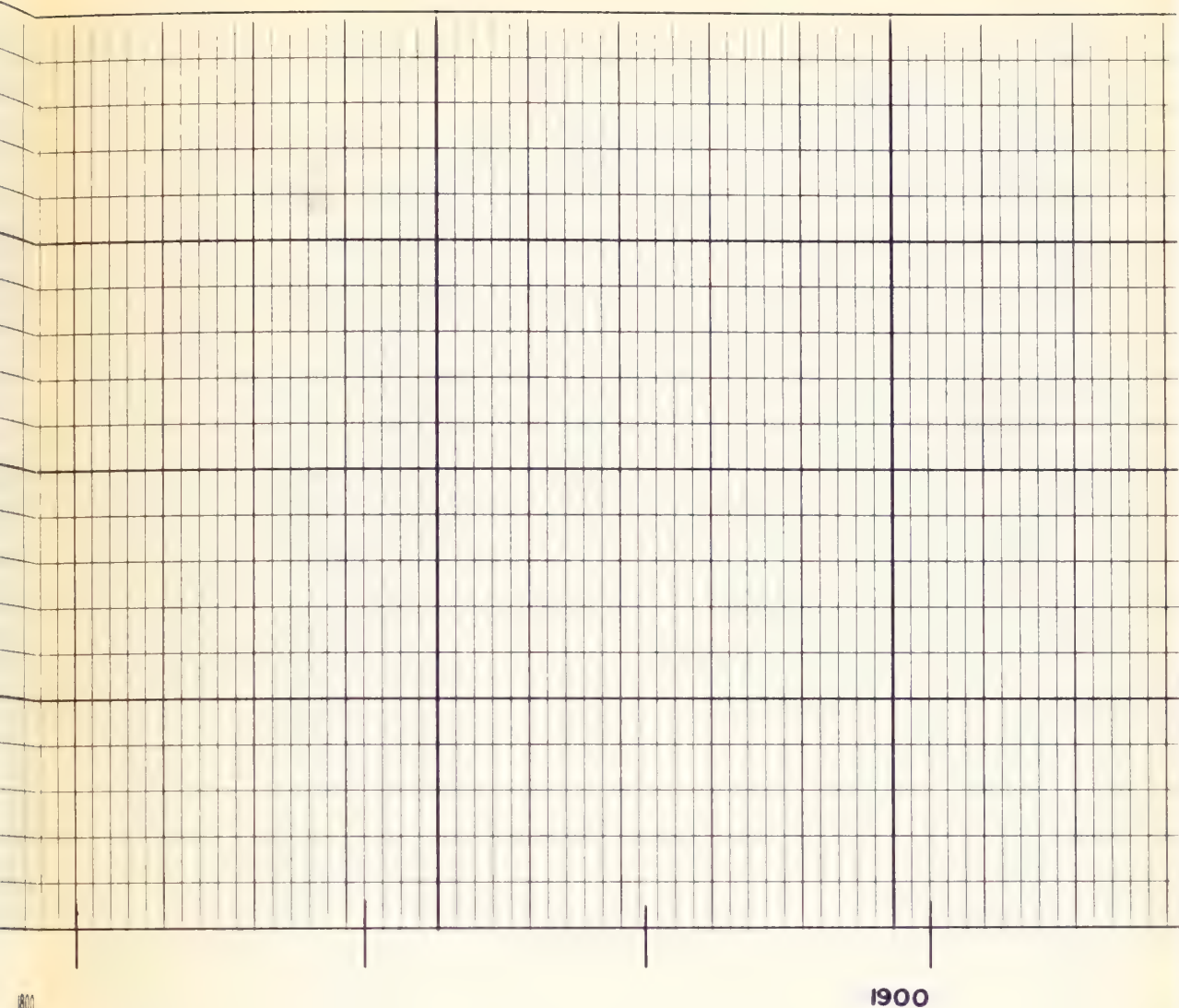




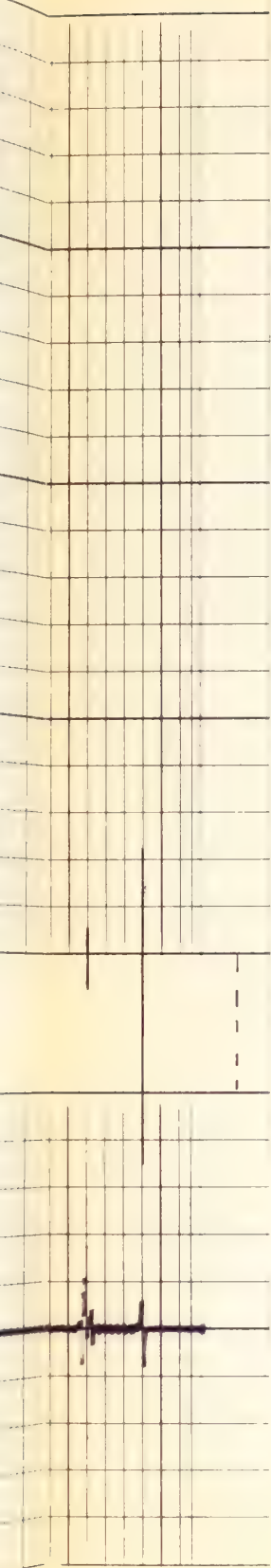
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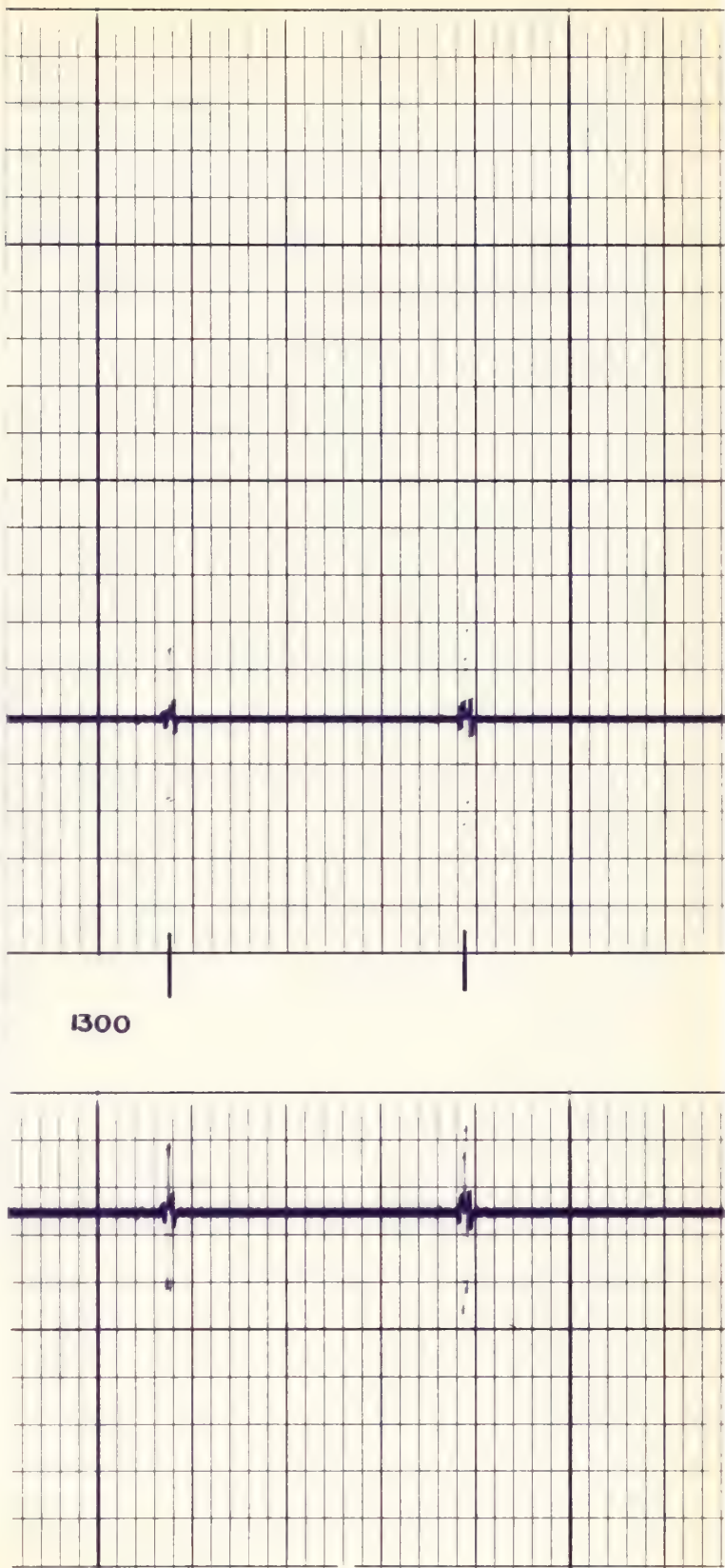


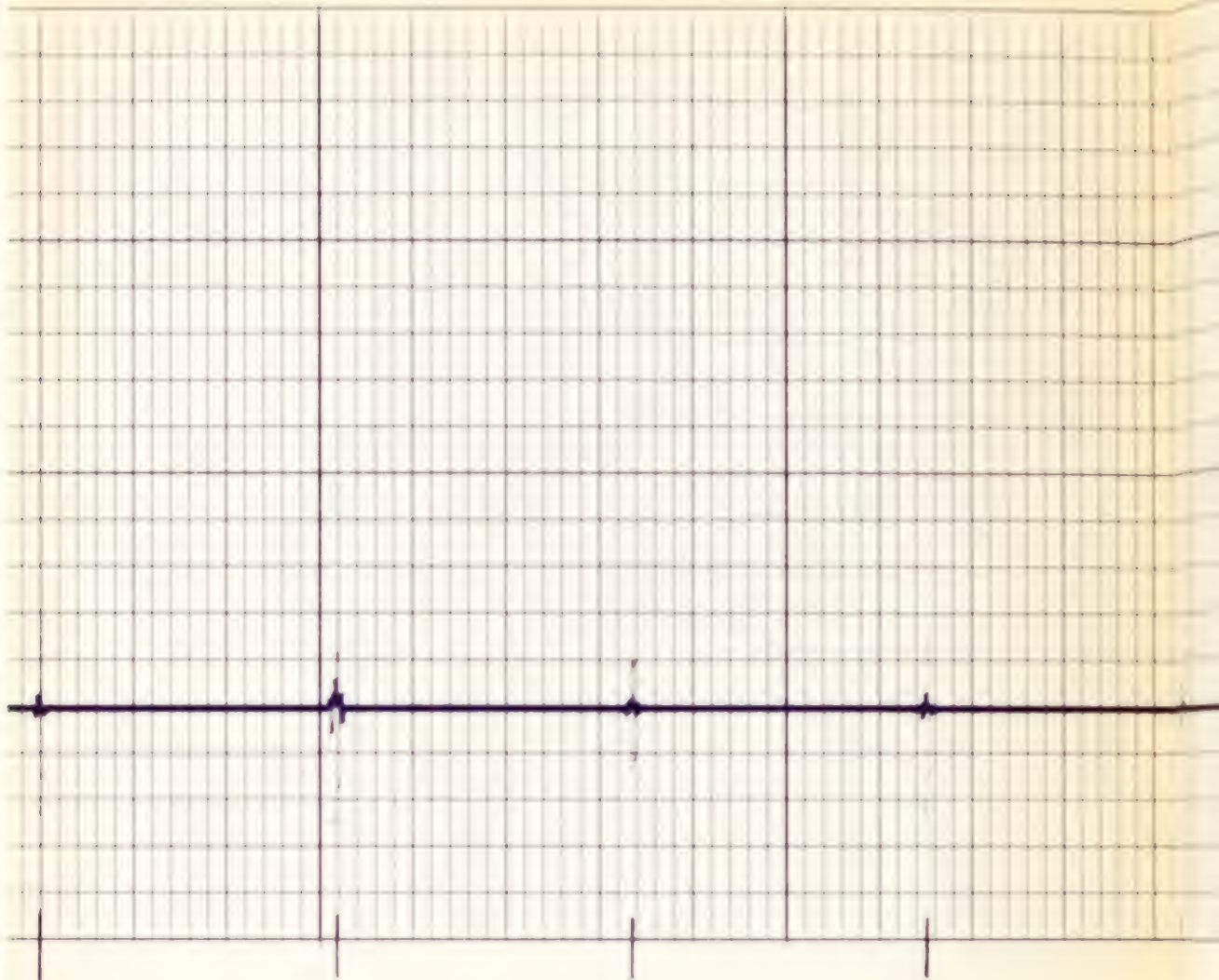
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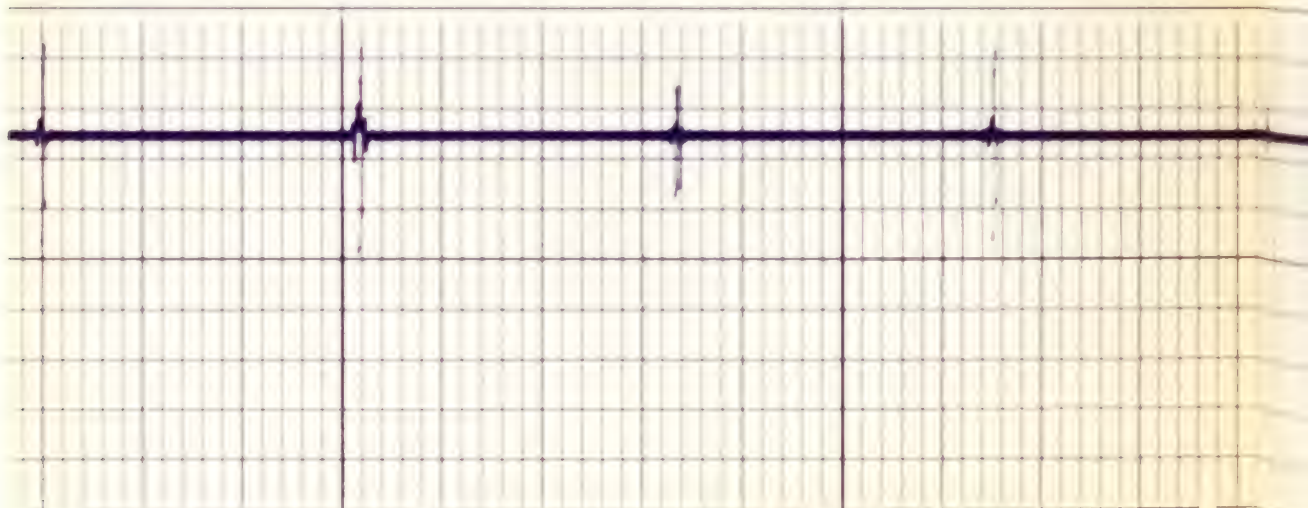
COLLAR LOG RUN AFTER PERFORATING

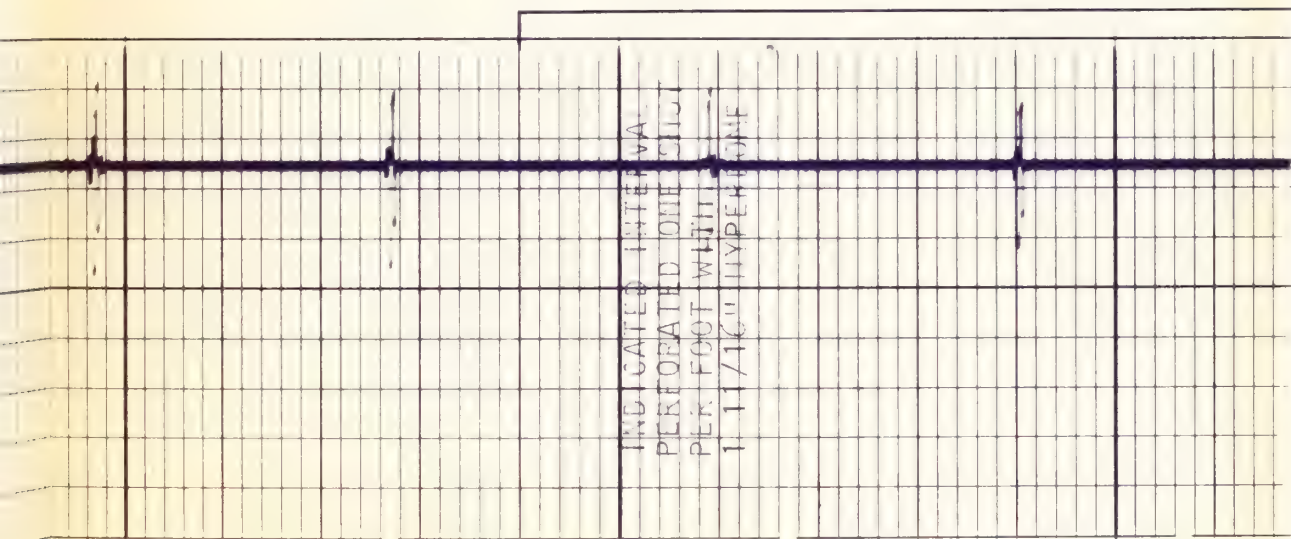
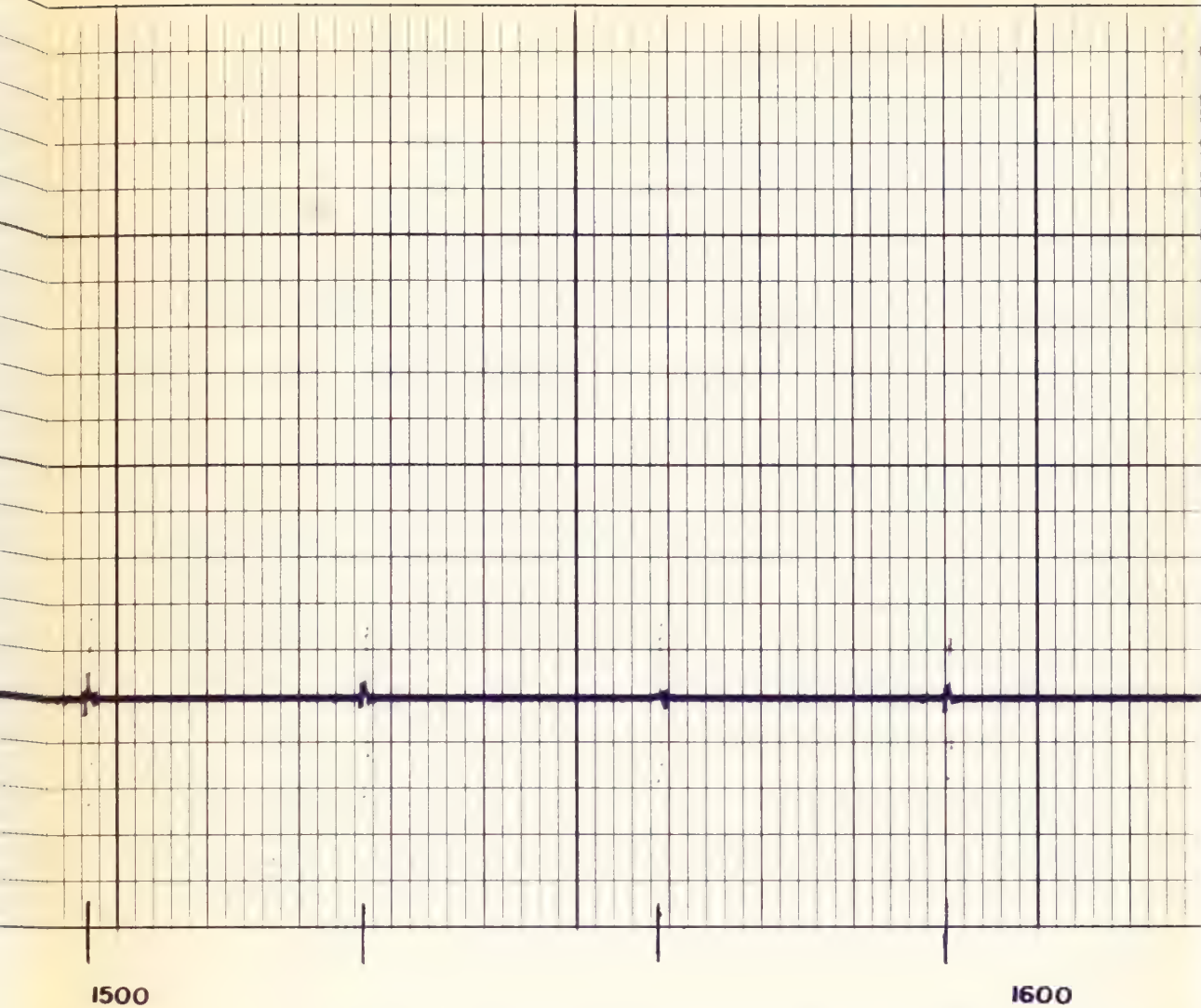
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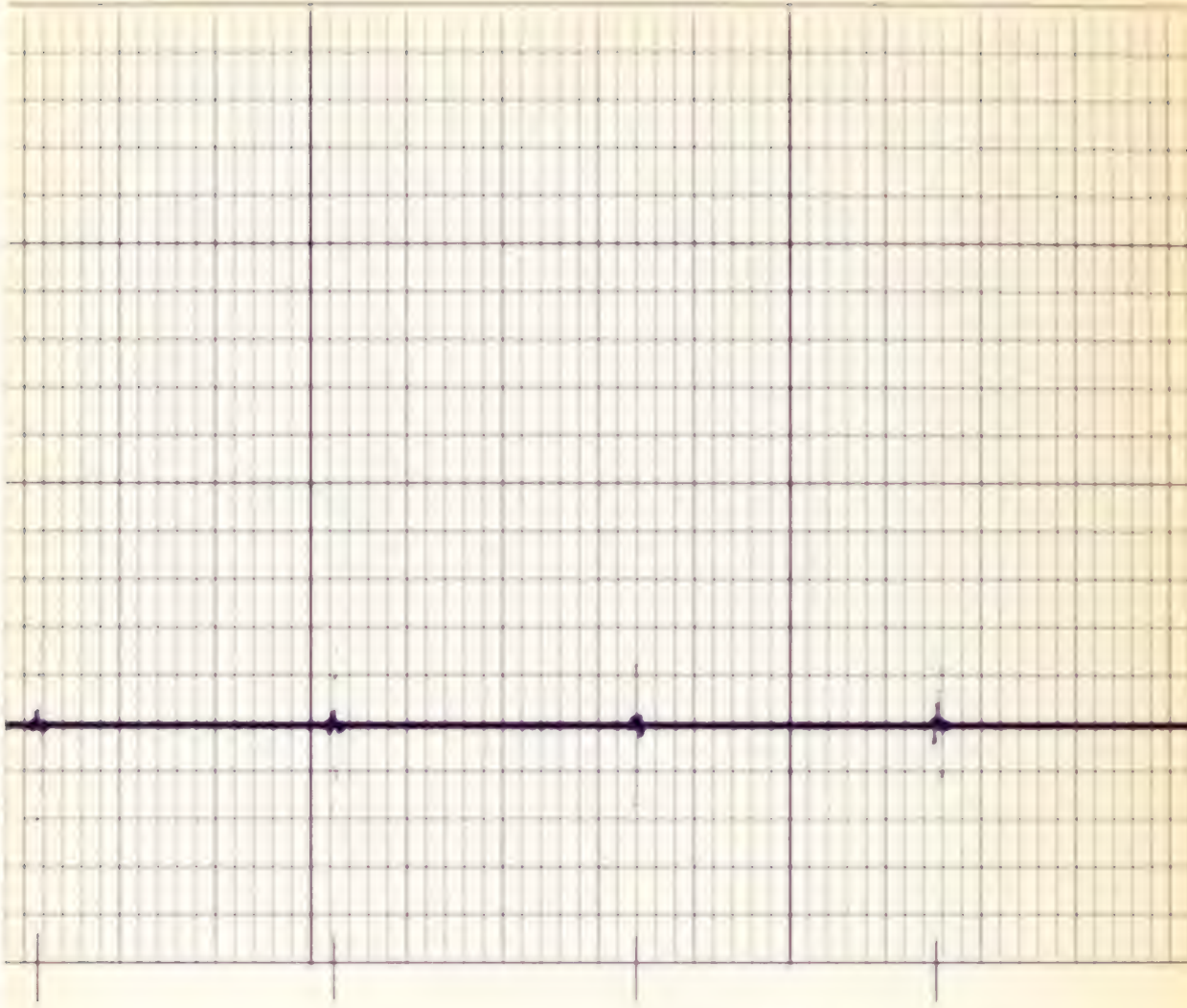




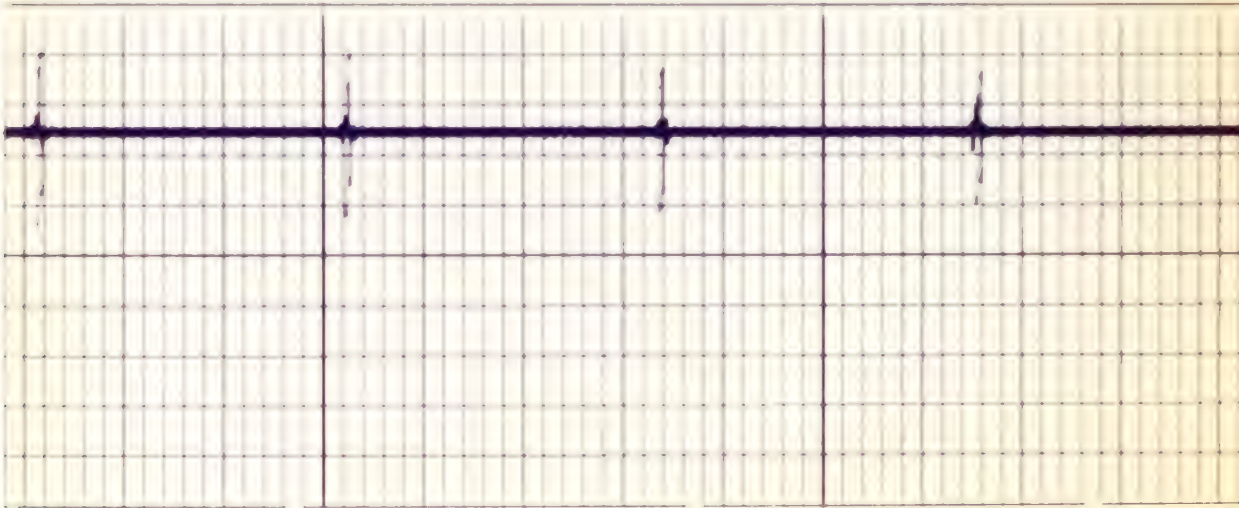
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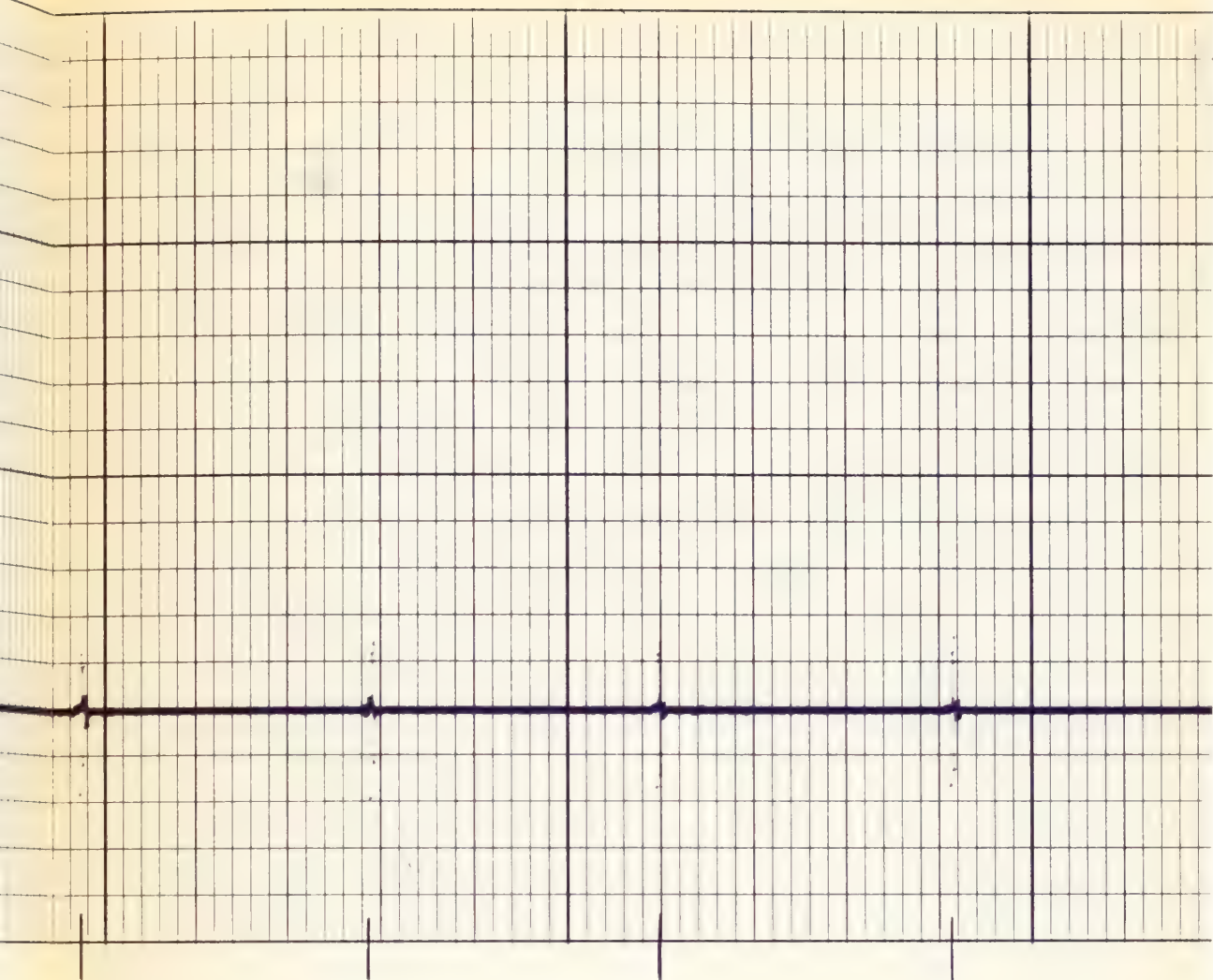




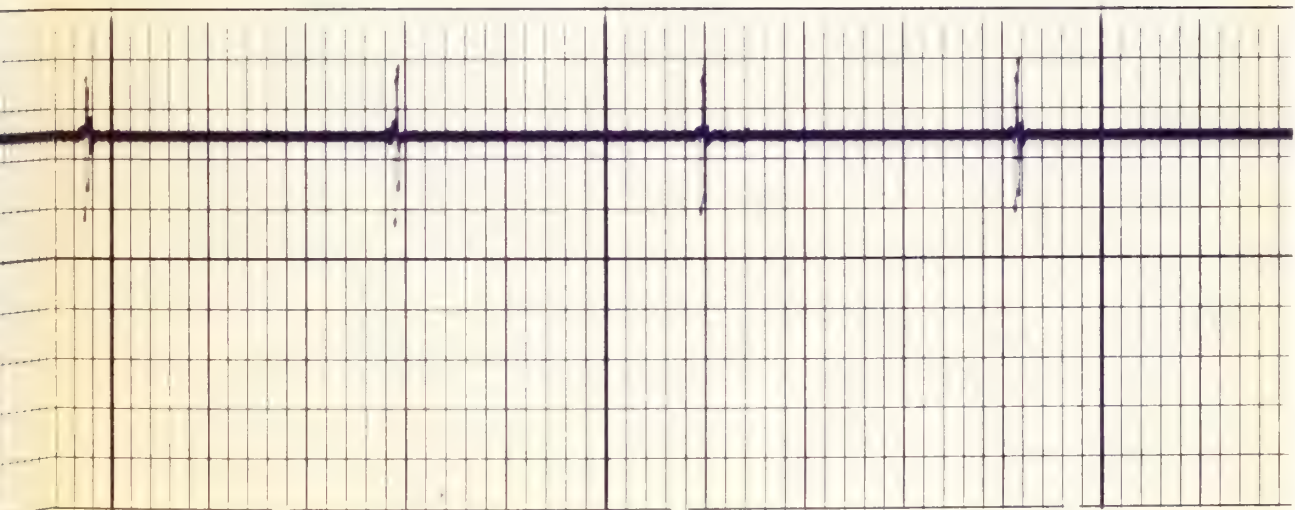


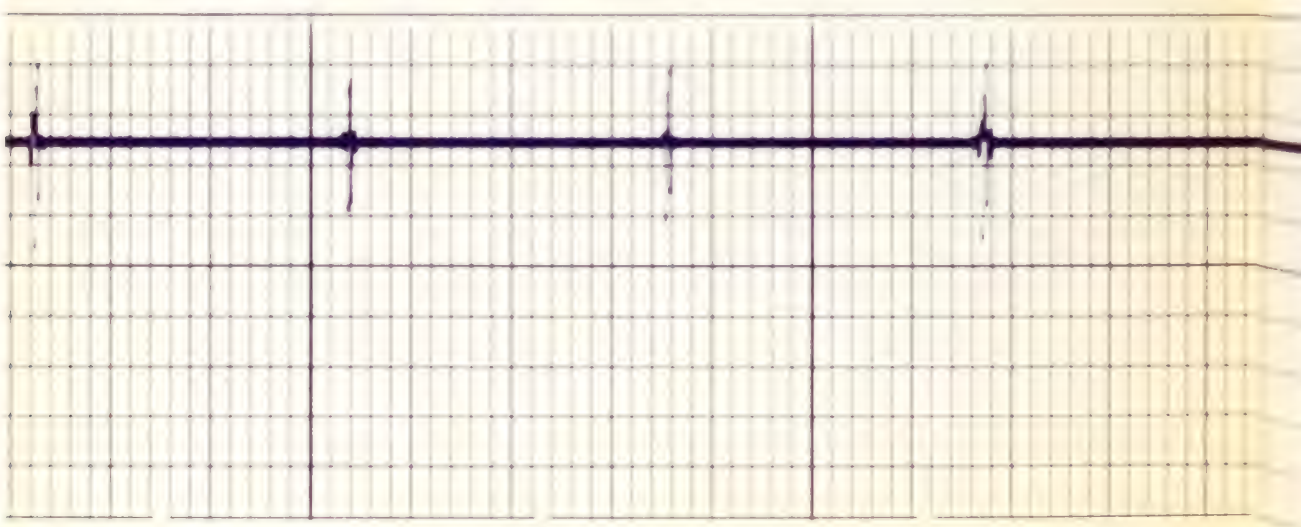
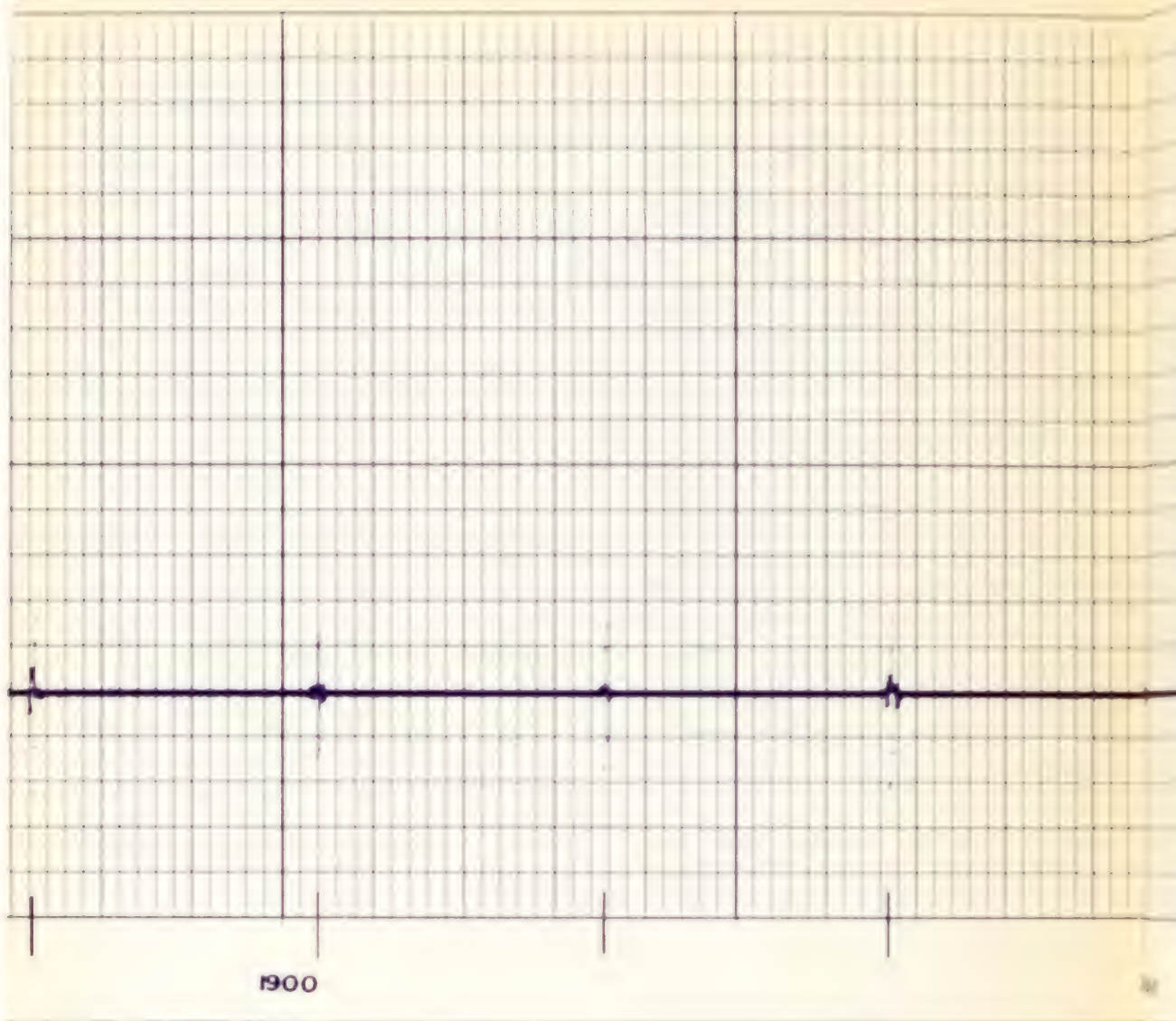
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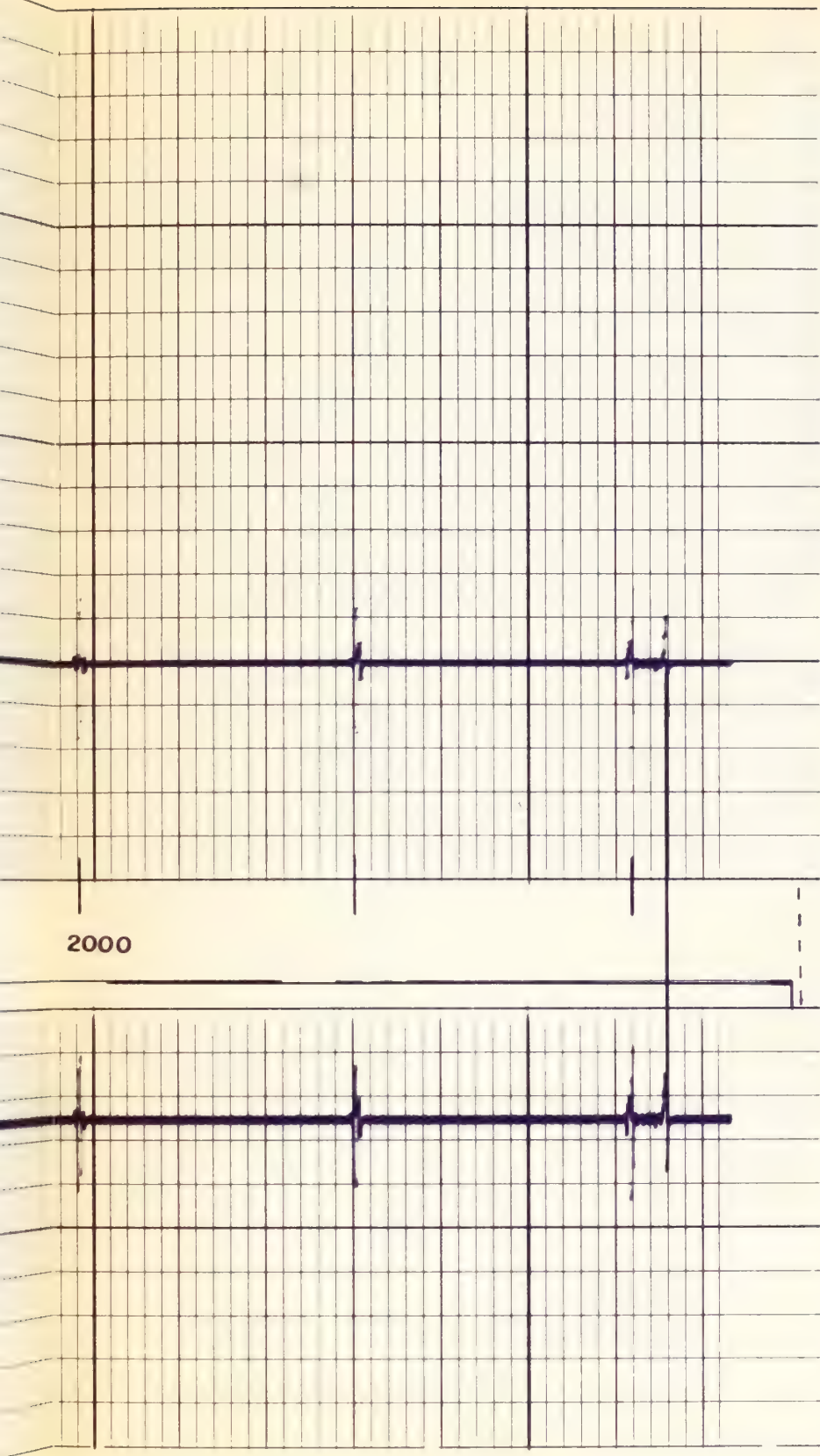




1800







2000

CASING COLLAR LOG
AFTER PERFORATION

DEPTHS

COMPANY

ATLANTIC SLOPE FIELD COMPANY

SCHL. TD
DRLR TD

WELL _____

FIELD _____

COUNTY _____ STATE _____

Elev:

KB _____

DF _____

GL _____

County
Field & Glass

Wells
Fields
Glass

8

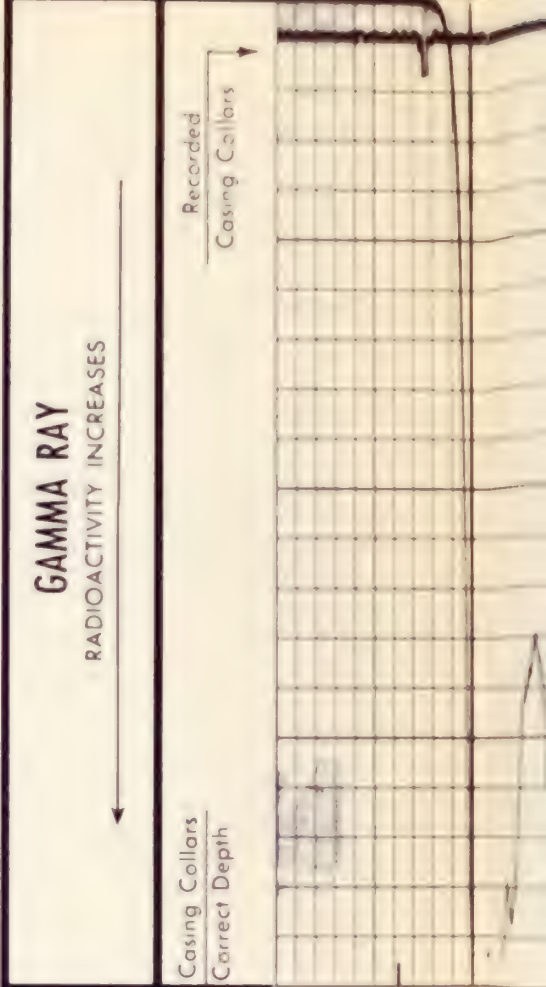
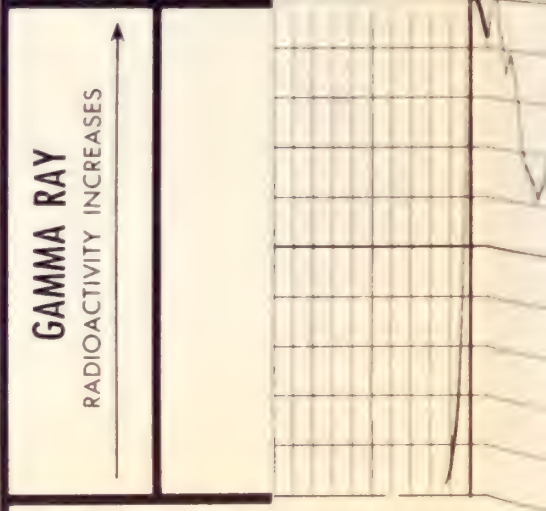
PERFORATING DEPTH CONTROL

[illegible]

EQUIPMENT DATA

Gamma Ray

| | |
|--|------------------------------------|
| Rug. No. | ONE |
| Tool Model No. | GNT-5 |
| Diameter | 1 11/16" |
| Def'r Model No. | SGD-H |
| Type | SCINT |
| Length | 8" |
| S. O. No. | 49323 |
| General | |
| Hoist Truck No. | 3862 |
| Inst. Truck No. | 3862 |
| Tool Serial No. | 18 |
| Location | VERNAL |
| Remarks: | Casing Collars recorded 3 ft. DEEP |
| FIRST JOINT OF TUBING & SURFACE IS BENT-HAS TROUBLE GETTING IN HOLE-ALSO STOPPED AT 1832-FINALLY GOT TO BOTTOM GRAY-EOTTON STICK | |



Casing Collars

Recorded Depth
(3' Deep)

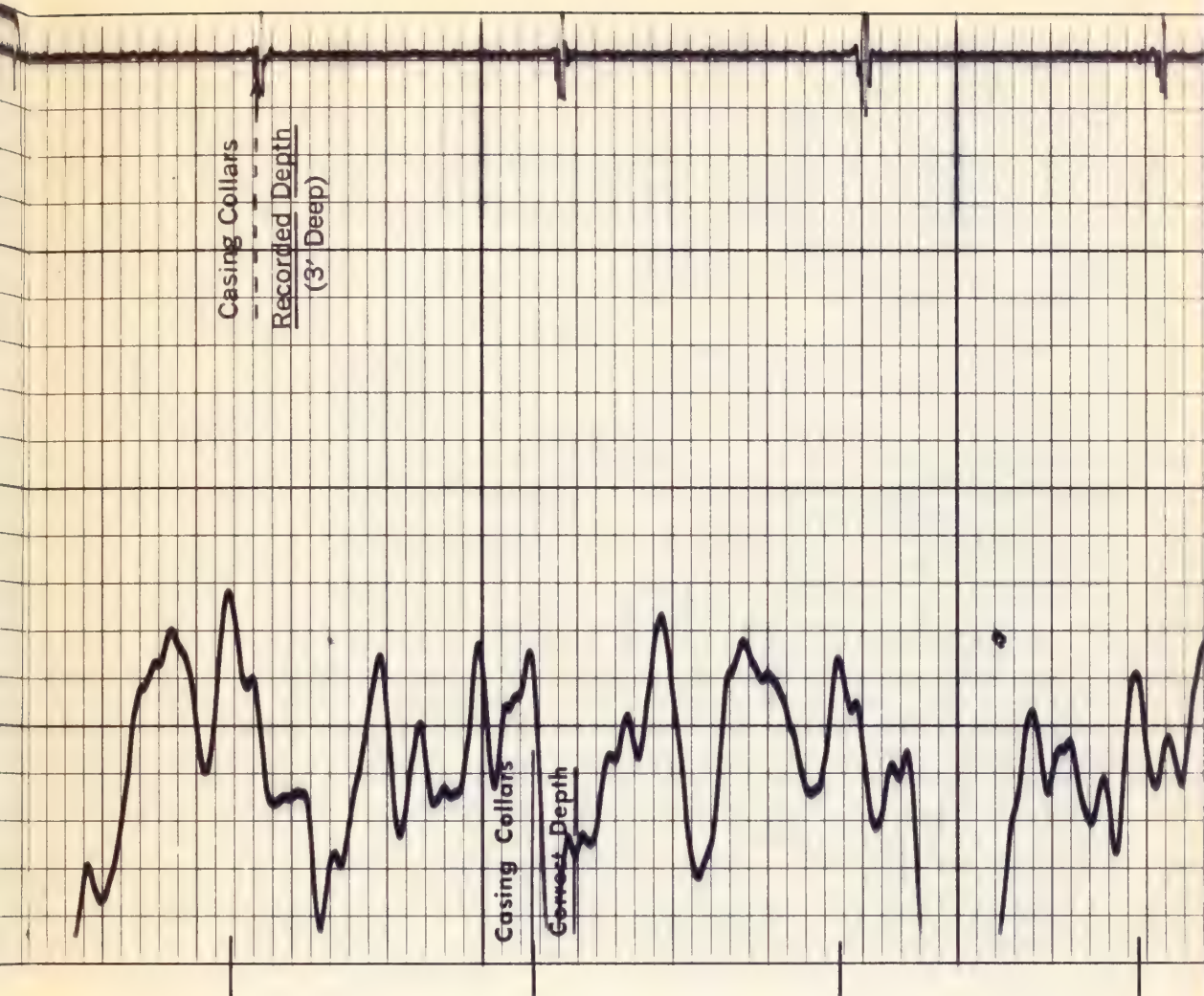
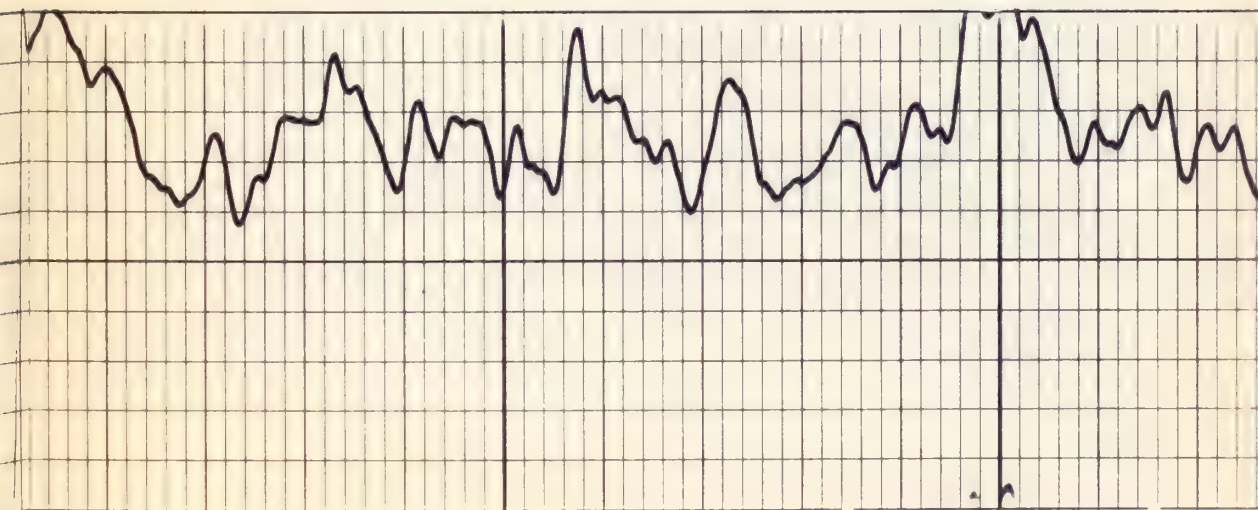
Casing Collars

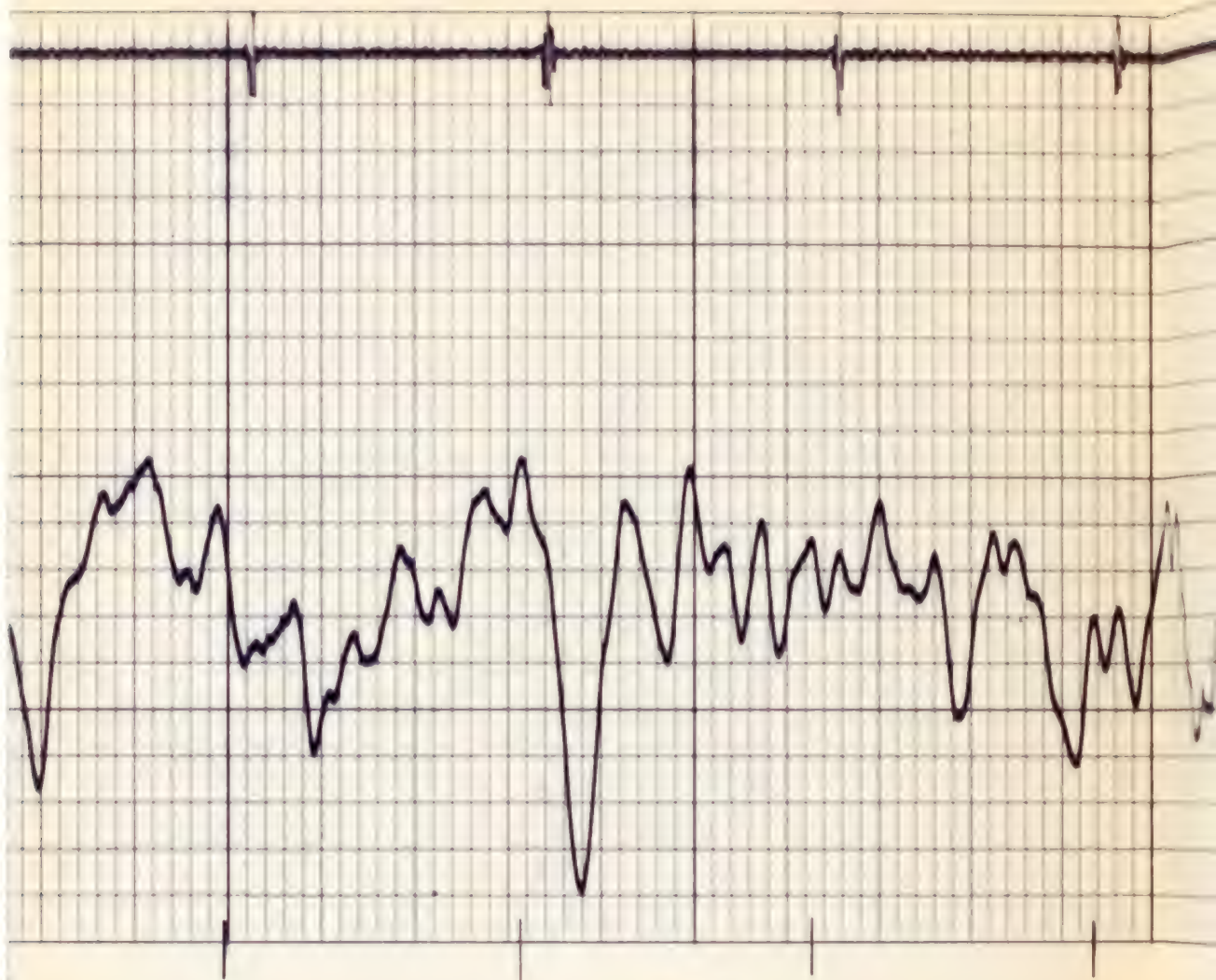
Recorded Depth

Recorded Depth

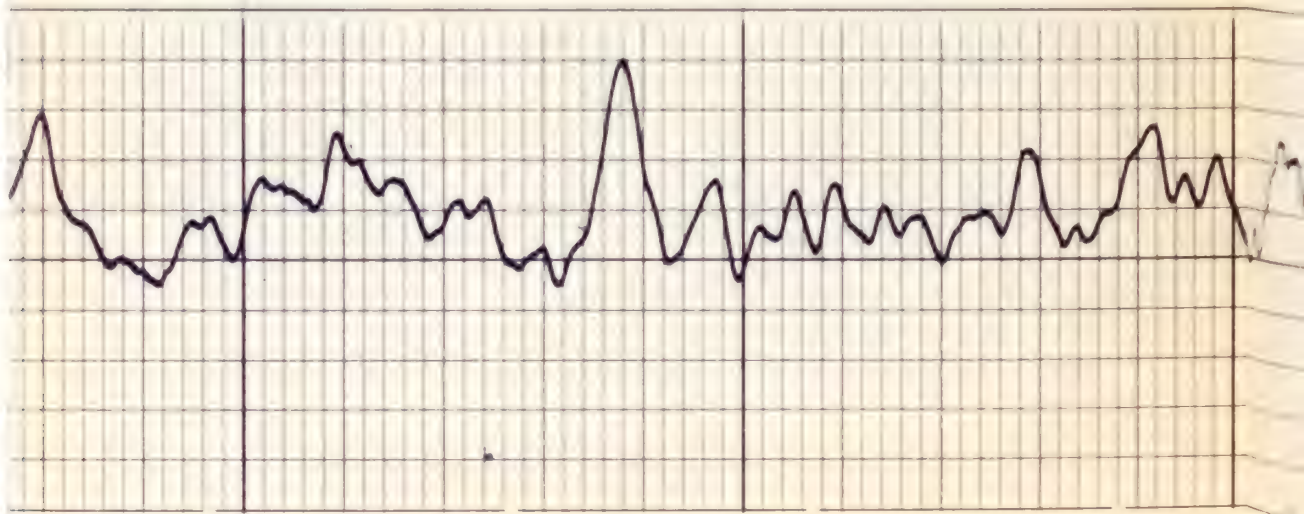
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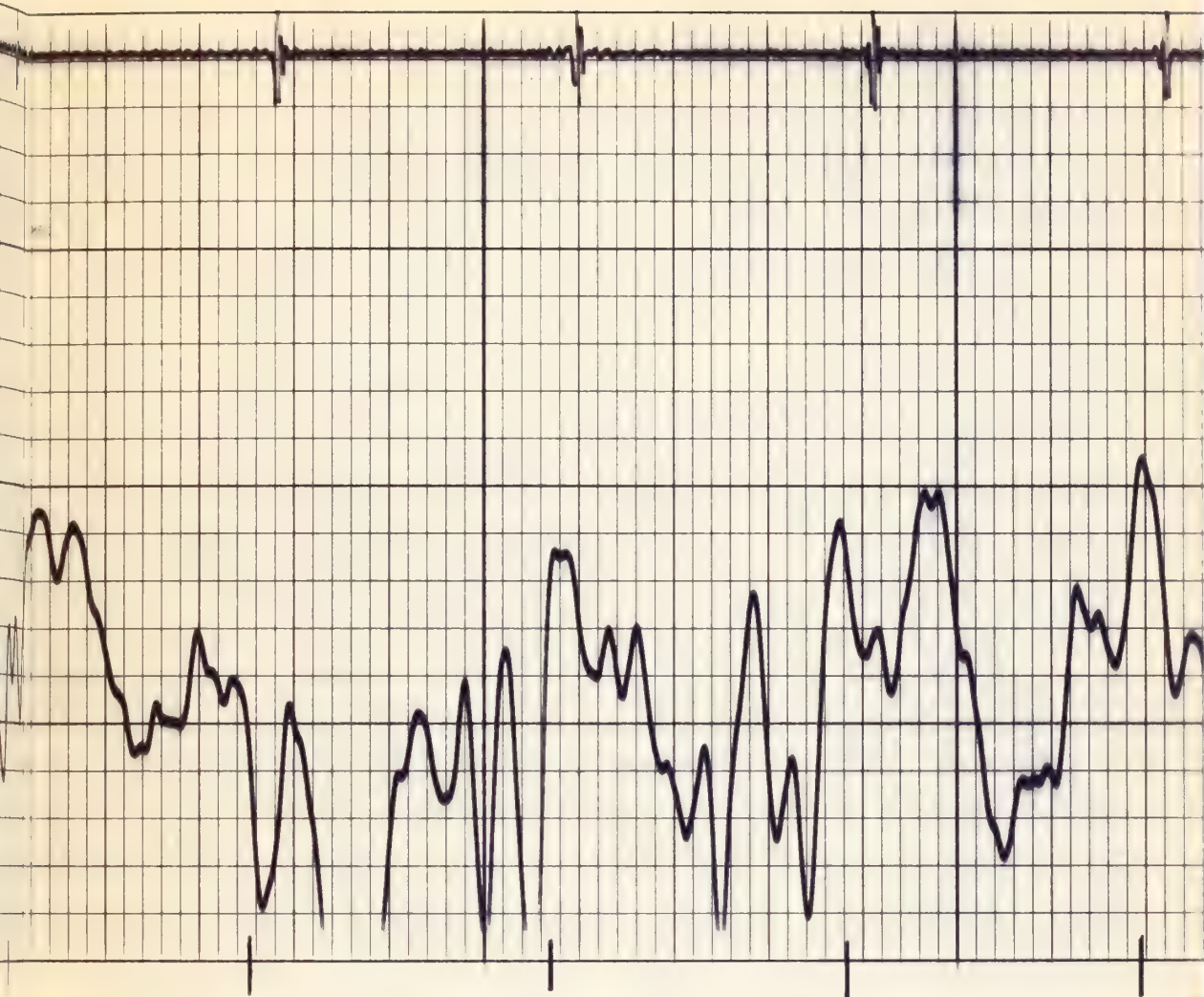
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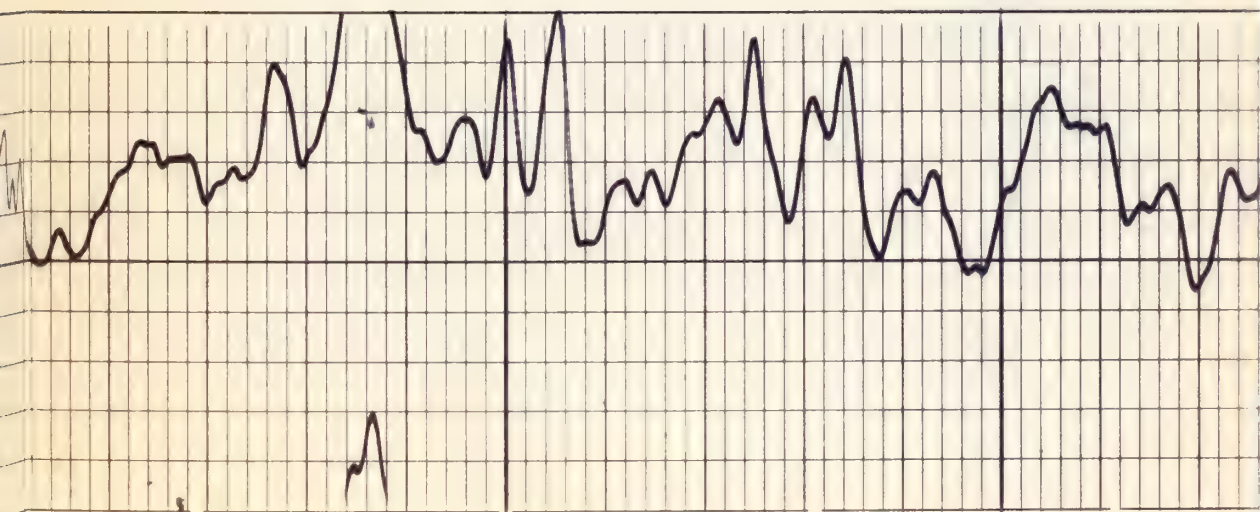


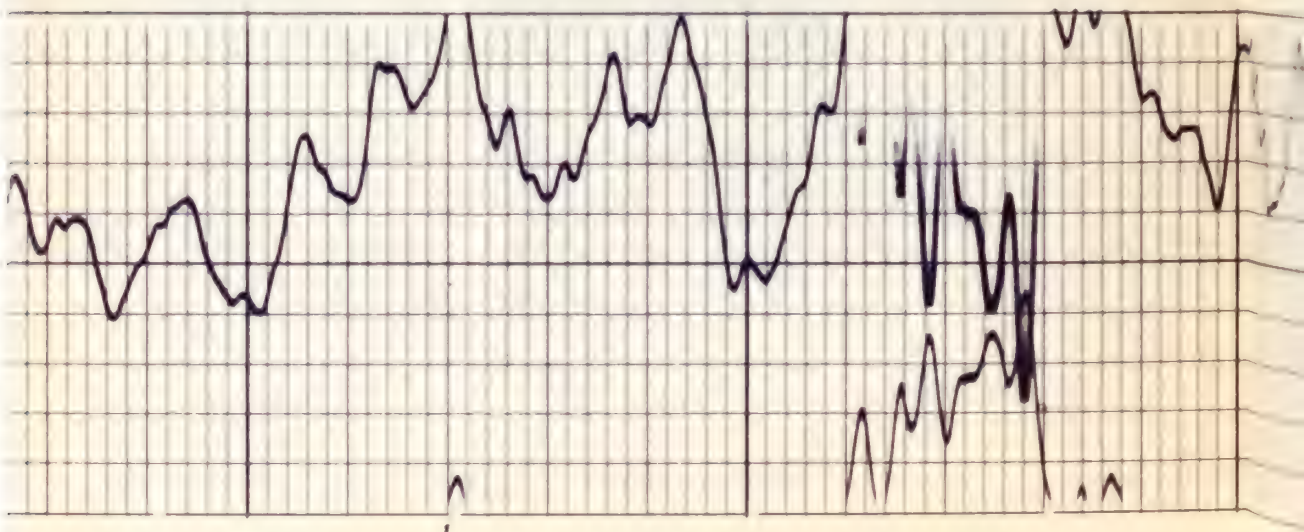
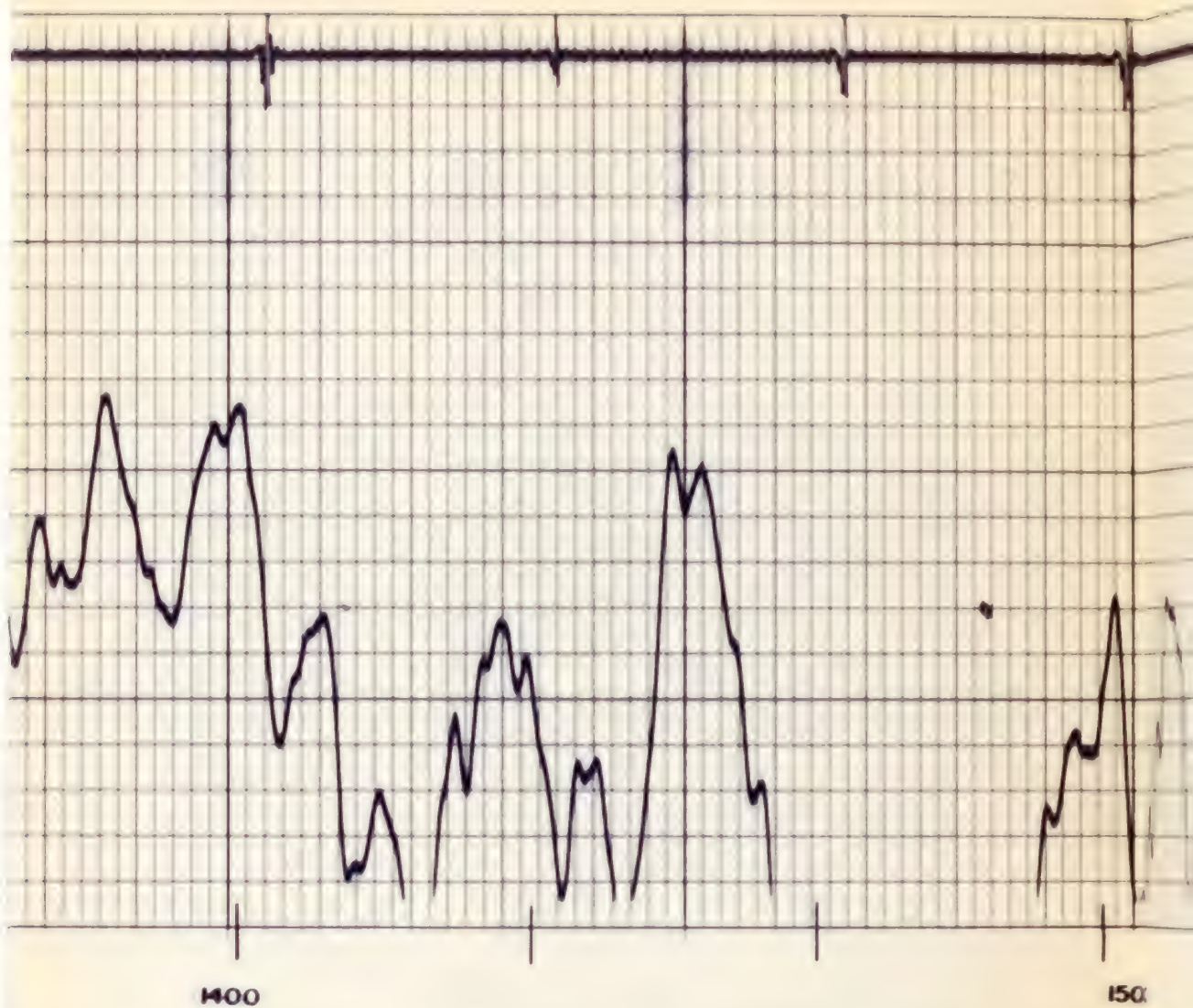
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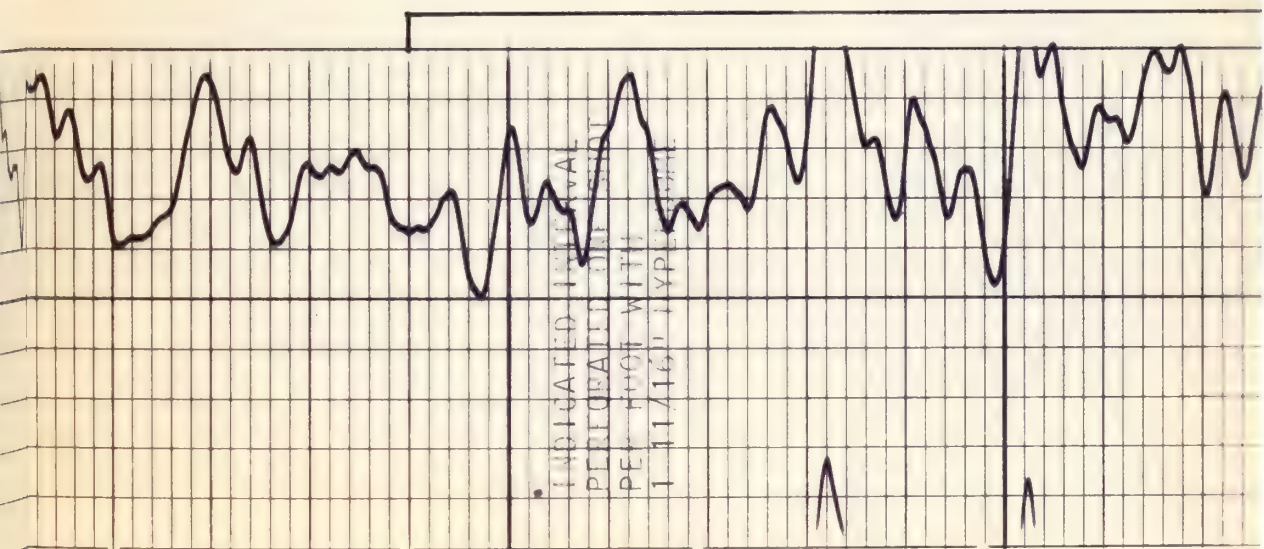
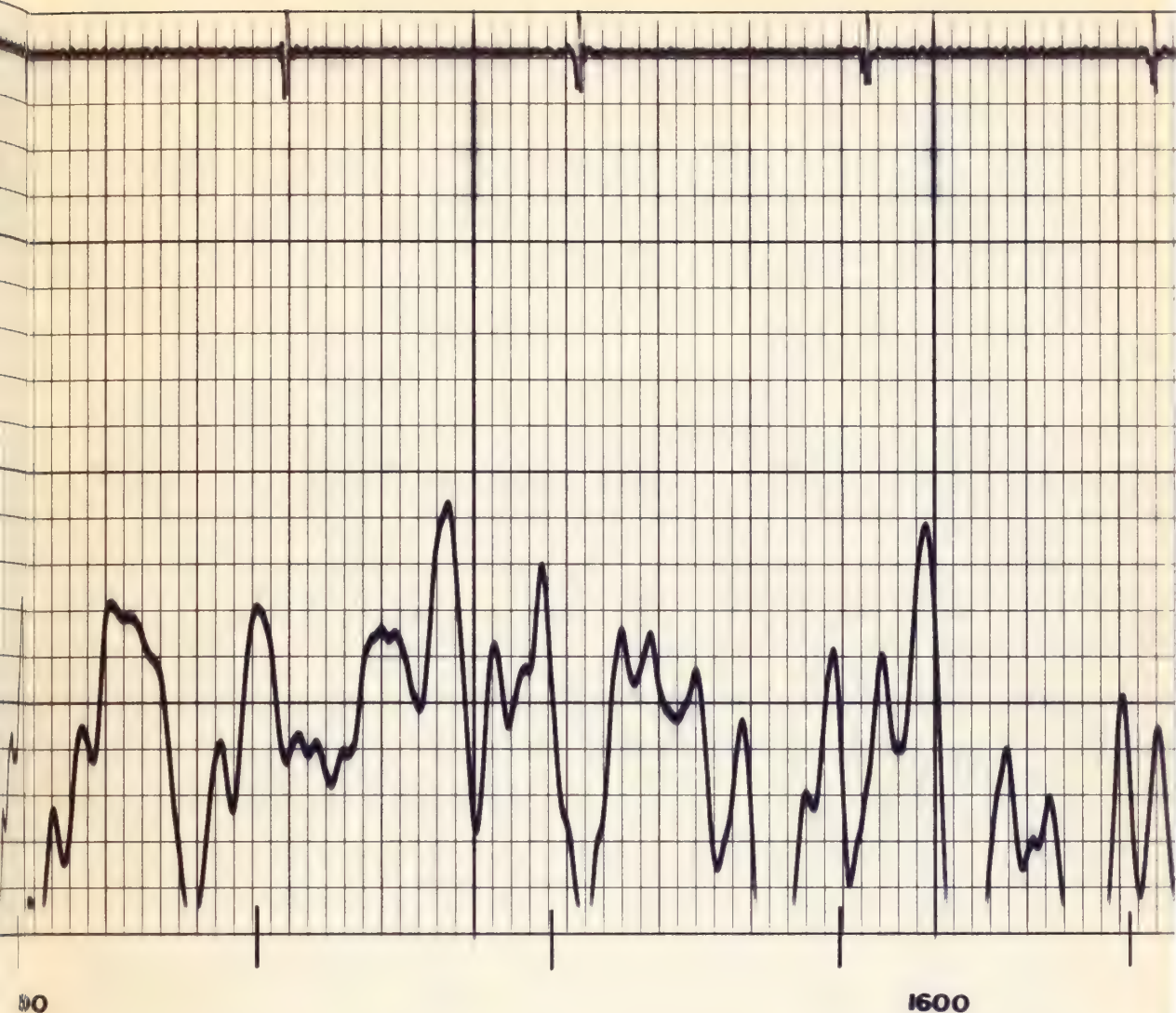


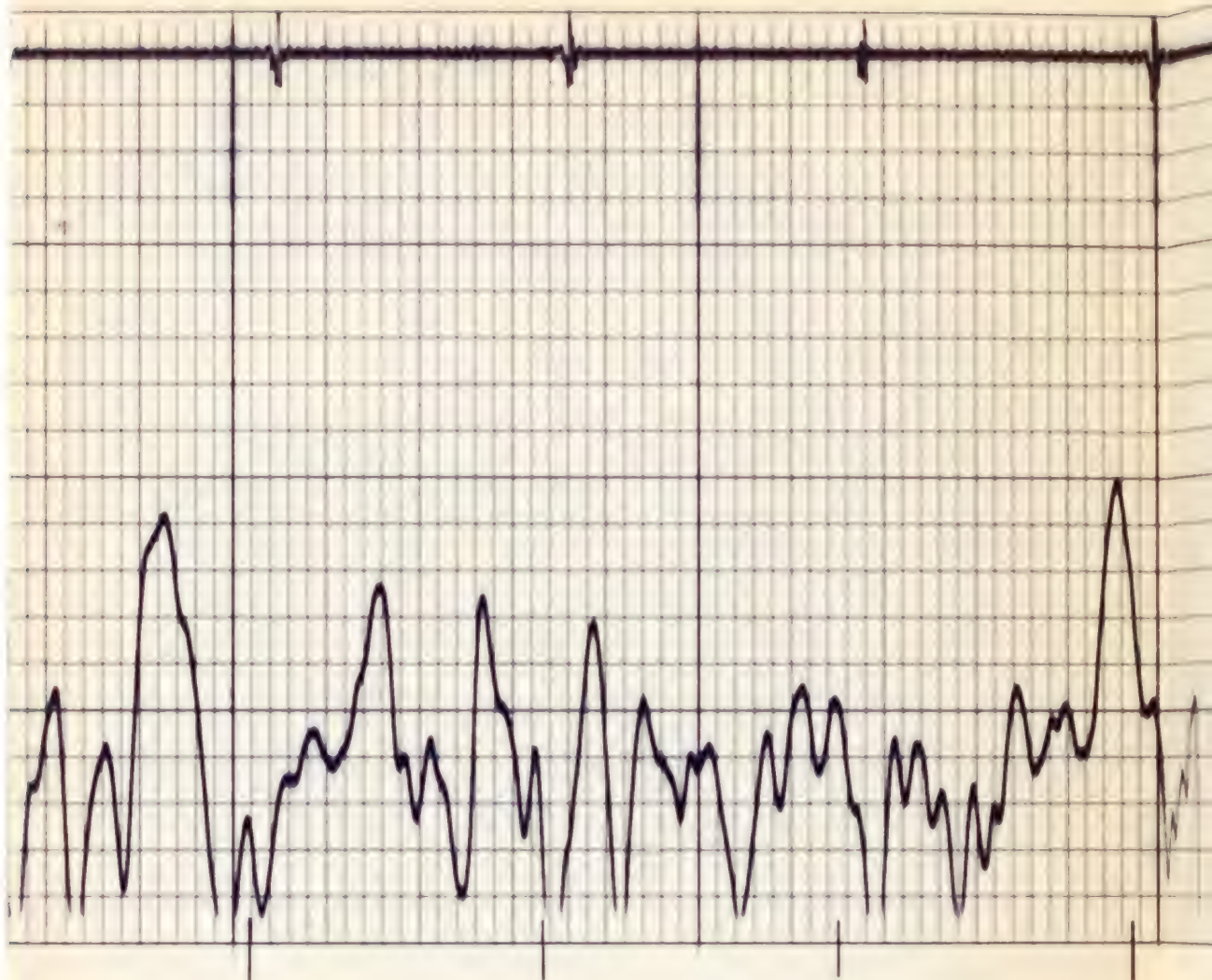


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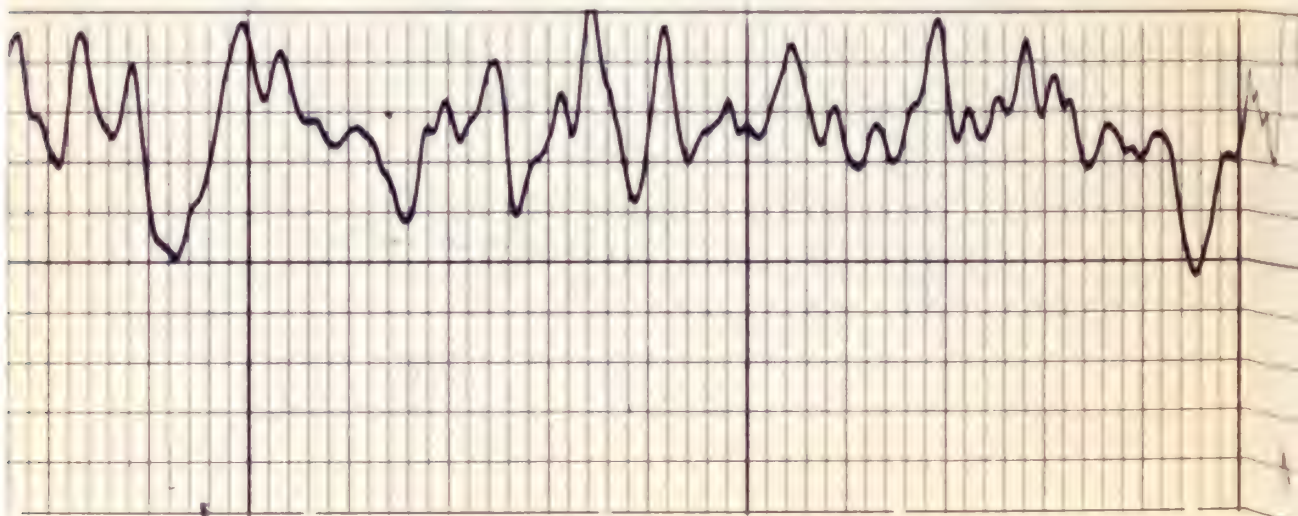


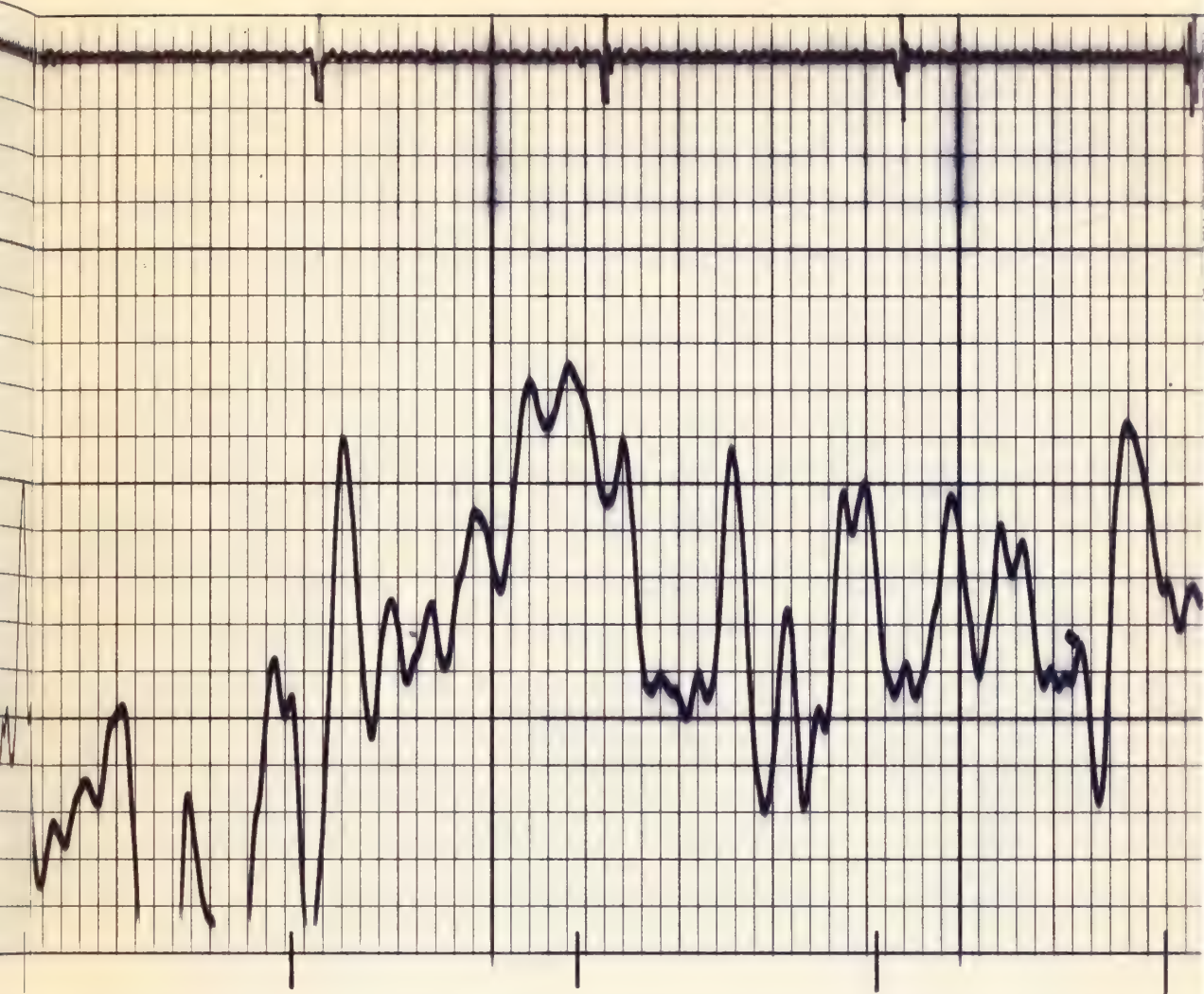




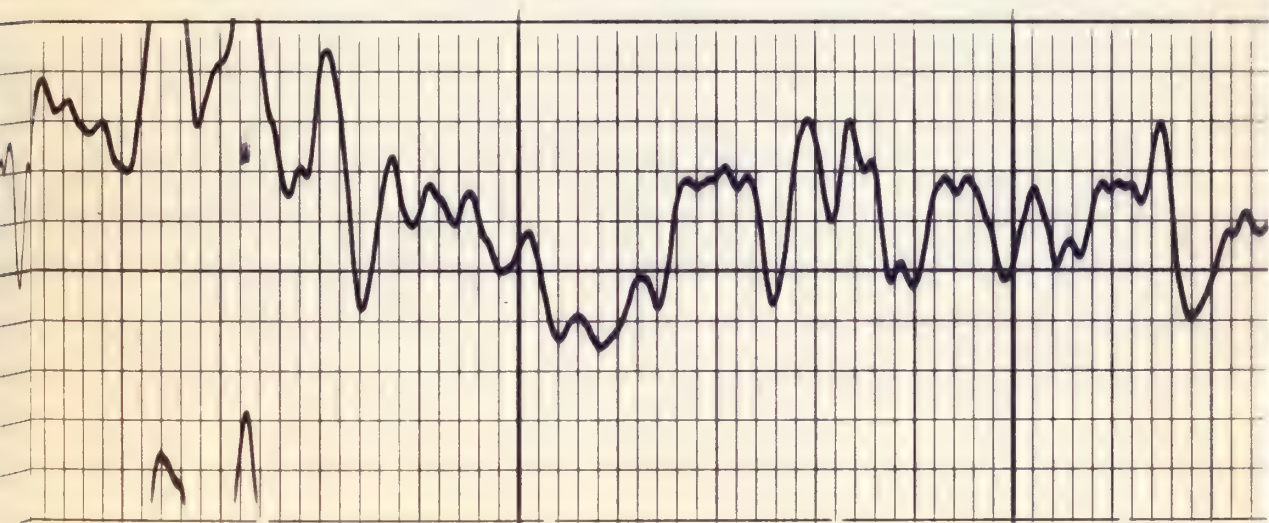


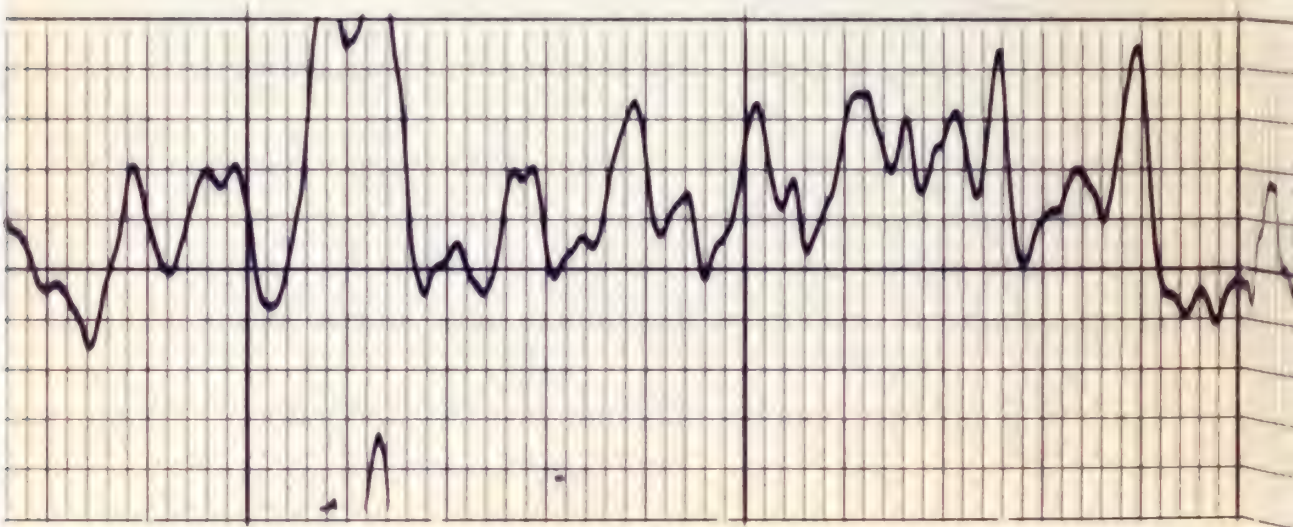
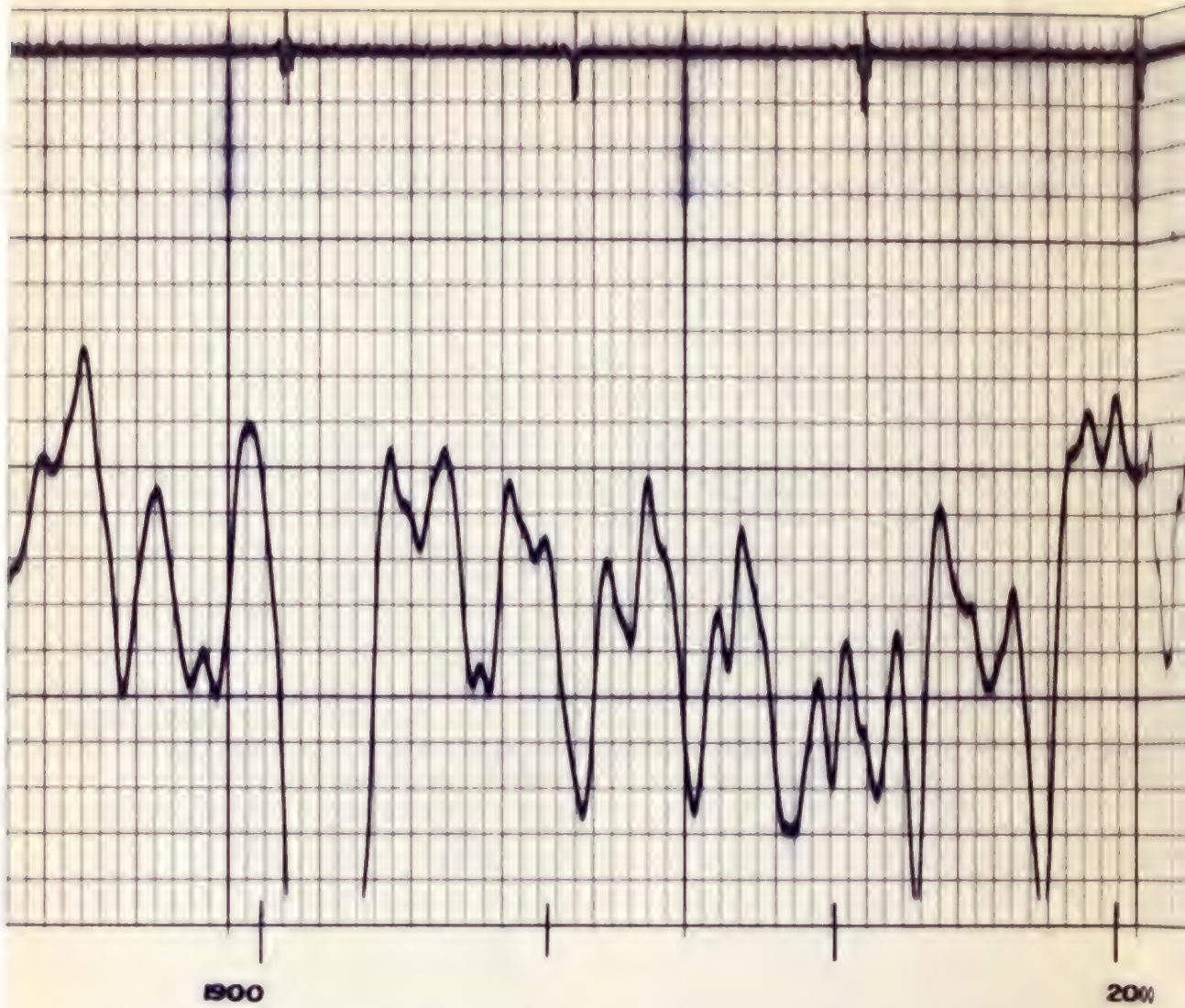
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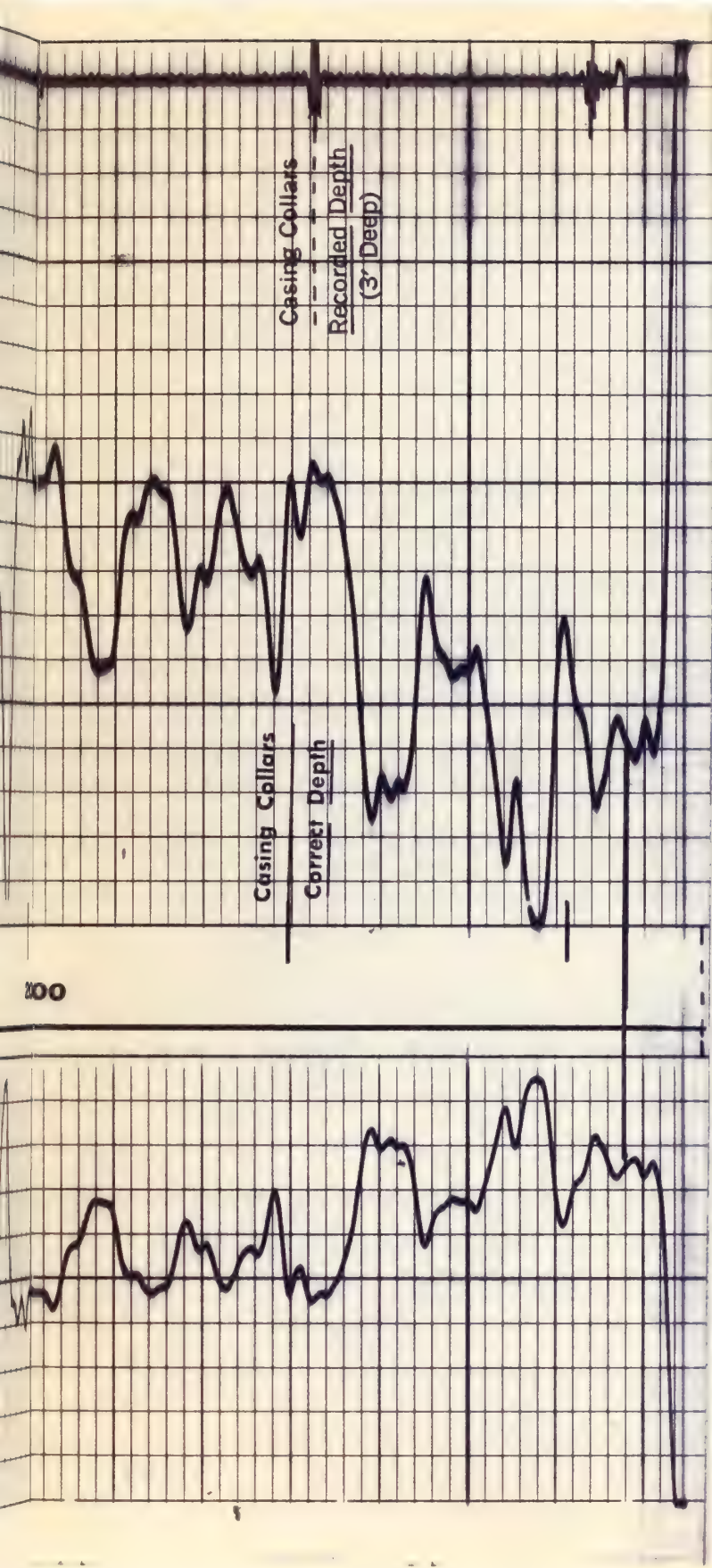




1800







| | | |
|---|---|--|
| <p>Recorded Casing Collars</p> | <p>GAMMA RAY RADIOACTIVITY INCREASES</p> | <p>SCHL. FR 2063 SCHL. TD 1978 DRIR. TD 1174</p> |
| <p>Casing Collars Correct Depth</p> | <p>GAMMA RAY RADIOACTIVITY INCREASES</p> | |
| <p>DEPTHS</p> | <p>GAMMA RAY RADIOACTIVITY INCREASES</p> | <p>COMPANY ATLANTIC RICHFIELD COMPANY</p> |
| <p>WELL - 00-1</p> | | |

FIELD

COUNTY

RIO BLANCO STATE

COLORADO

COPIES
1

1

1

1

1

1

1

1

1

1

Schlumberger

CEMENT BOND LOG

VDL-CCL

COUNTY RIO BLANCO

Field or

LOCATION

WELL

CD-2

COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL CD-2

FIELD

COUNTY RIO BLANCO STATE COLORADO

LOCATION 1589' FSL & 1300' FEL

API Serial No.

Sec. 6 Twp. 3S Rge. 96W

Other Services:

PDC-GR

SPH

Permanent Datum: GROUND LEVEL, Elev. _____
 Log Measured From GL, 0 Ft. Above Perm. Datum
 Drilling Measured From GL

Elev.: K.B. ----
 D.F. ----
 G.L. 6737

| | | | |
|-------------------|----------|------------------|-------------|
| Date | 10-14-74 | Type Drill Fluid | WATER |
| Run No. | ONE | Fluid Level | FULL |
| Depth — Driller | 1454 | Max. Rec. Temp. | ---- °F |
| Depth — Logger | 1441 | Est. Cement Top | 1146 |
| Btm. Log Interval | 1431 | Equip. Location | 3362 VERNAL |
| Top Log Interval | 1000 | Recorded By | ST. AUBYN |
| Open Hole Size | 4 3/4 | Witnessed By | MR. ELLARD |

| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom |
|----------------|-------|-------|-------|------------|------|--------|
| Surface String | | | | | | |
| Prot. String | | | | | | |
| Prod. String | 2 3/8 | 4.7 | | T-C | SURF | 1460 |
| Liner | | | | | | |

PRIMARY CEMENTING DATA

| STRING | Surface | Protection | Production | Liner |
|--------------------|---------|------------|------------|-------|
| Vol. of cement | | | 10 SCS. | |
| Type of cement | | | CLASS "G" | |
| Additive | | | 2% CACL. | |
| Retarder | | | | |
| Wt. of slurry | | | | |
| Water loss | | | | |
| Type fluid in csg. | | | | |
| Fluid wt. | | | | |

The well name, location and borehole reference data were furnished by the customer.

FOLD HERE

PRIMARY CEMENTING PROCEDURE

| | Hour - date | Hours from start of operation | REMARKS |
|------------------------|----------------|-------------------------------|----------------------------------|
| Started pumping cement | 14:00 3-16-74 | | Service Order No. |
| Release pressure | 15:00 3-16-74 | | Csg. Collars Recorded 1 ft. 7500 |
| Start Cement Bond Log | 22:00 10-14-74 | | |
| Finish Cement Bond Log | 13:00 10-14-74 | | |

| | | | |
|-----------------|--------------|--|----------|
| Preceding fluid | Volume bbls. | Pipe reciprocated during Pumping: Yes | No |
| Cement pumped | bbls./minute | Pipe reciprocated after plug down: Yes | min., No |

SQUEEZE JOB DETAIL

| | 1 | 2 | EQUIPMENT DATA | Centralizer Depths | Scratcher Depths |
|------------------------|---|---|----------------------|--------------------|------------------|
| Squeeze number | | | Sonic Panel No. | | |
| Date | | | Sonic Cart No. | | |
| Depth interval | | | Sonic Sonde No. | | |
| Type cement | | | CRP No. | | |
| Volume of cement | | | Mem Panel No. | | |
| Additive | | | GR Panel No. | | |
| Retarder | | | GR Cart No. | | |
| Weight of slurry | | | Centralizer Type No. | | |
| Preceding fluid | | | To Level (MV) | | |
| | | | Cart. Gain | | |
| Breakdown pressure | | | CRP Intensity | | |
| Max. pressure-stage 1 | | | R9G Intensity | | |
| " " 2 | | | | | |
| " " 3 | | | | | |
| Final maximum pressure | | | Logging Speed | | |
| | | | Time Constant | | |
| Started pumping cement | | | | | |
| Released pressure | | | | | |
| Start CBL | | | | | |
| Finish CBL | | | | | |

| | | | | | | |
|---------------------|------|----|------|----|------|----|
| AVERAGE WELL DRIFT: | from | to | from | to | from | to |
|---------------------|------|----|------|----|------|----|

TRANSIT TIME

TRANSIT TIME

MICROSECONDS _____ SPACING _____
400 200

DEPTH

CASING BOND

MILLIVOLTS

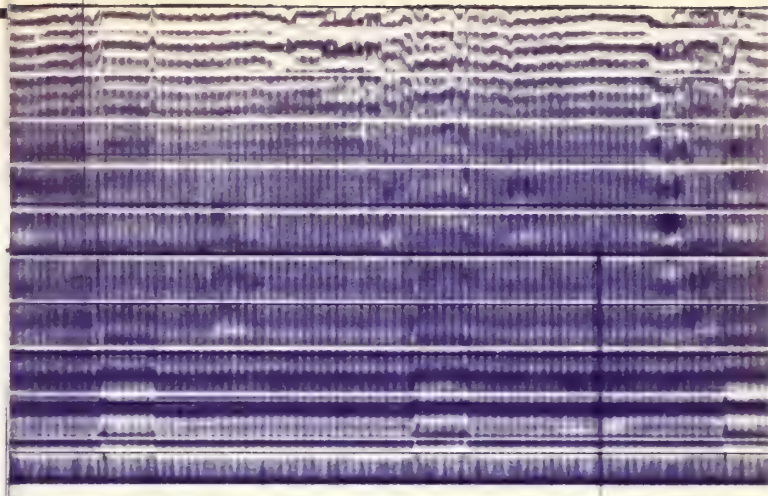
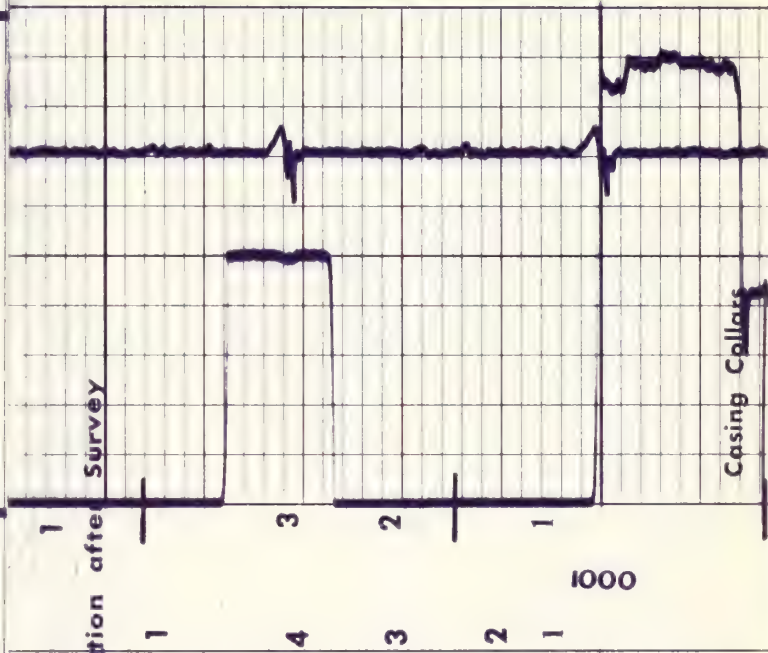
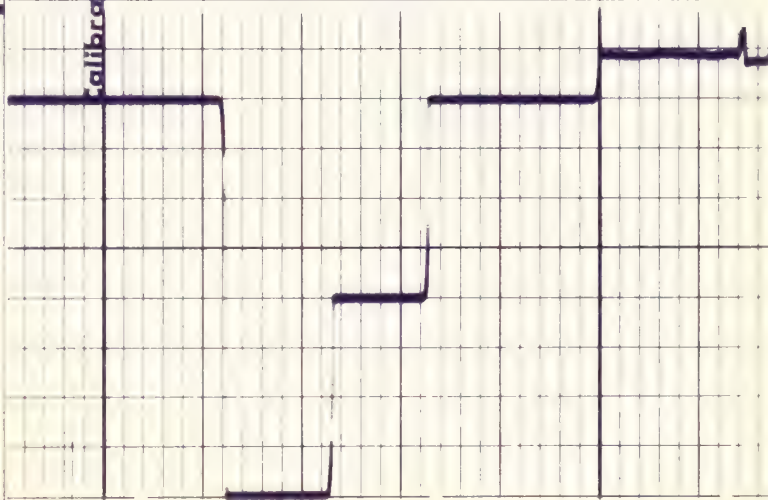
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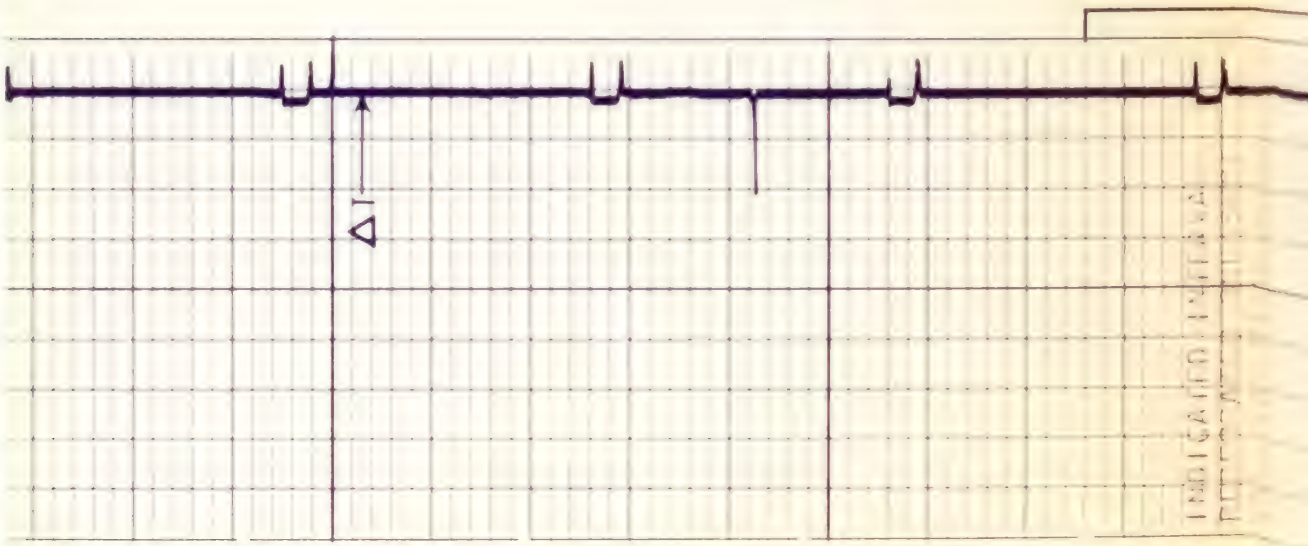
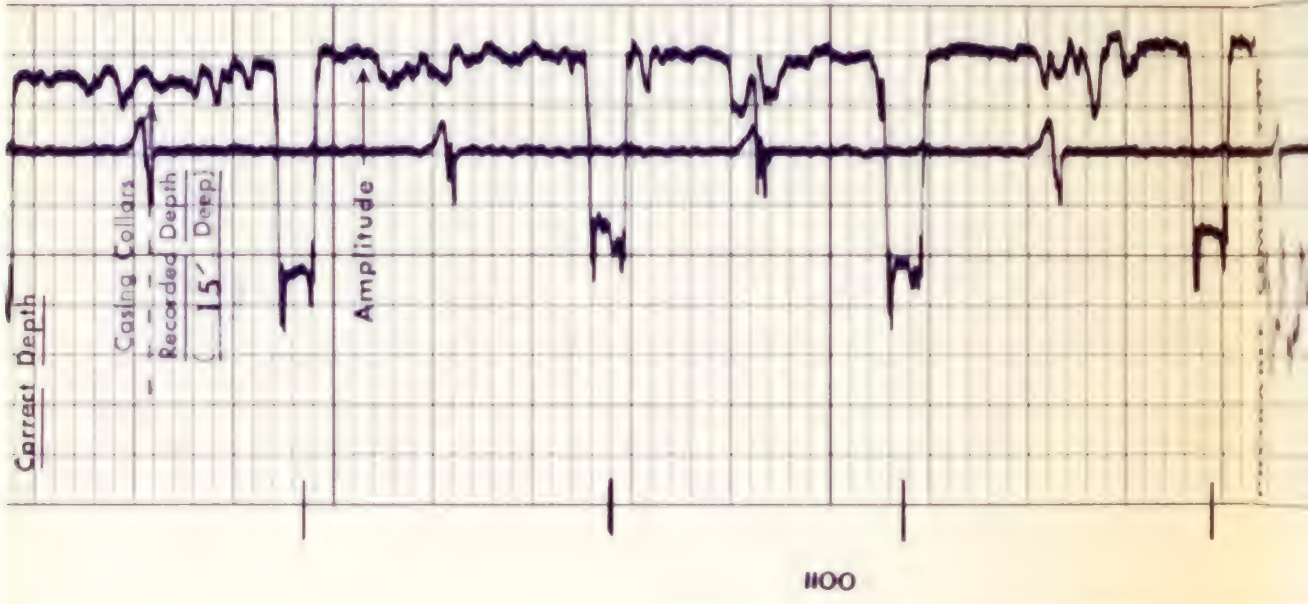
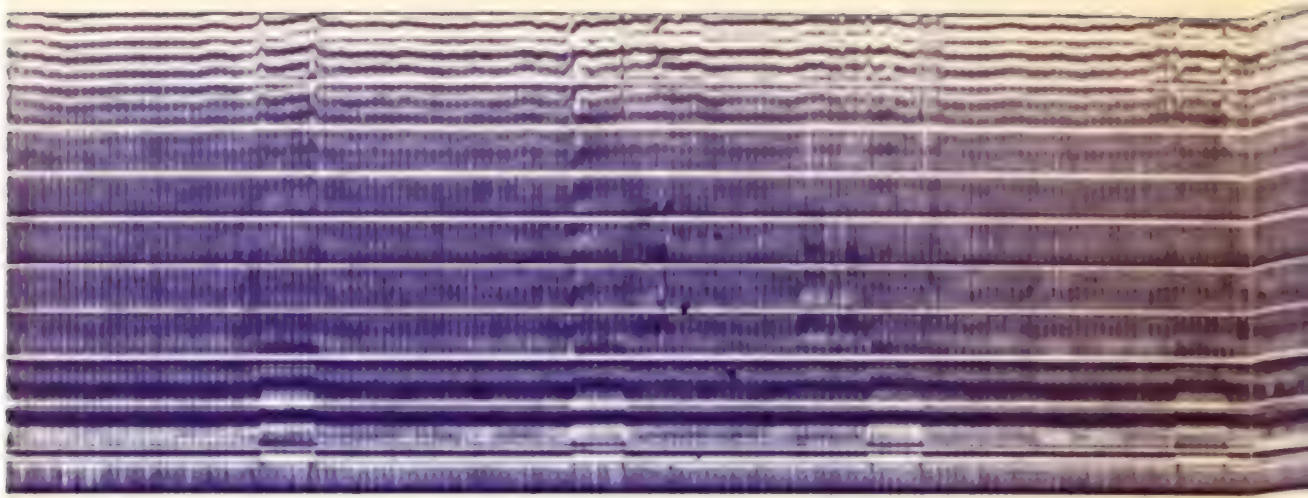
Casing Collars
Corrected Depth

VARIABLE DENSITY

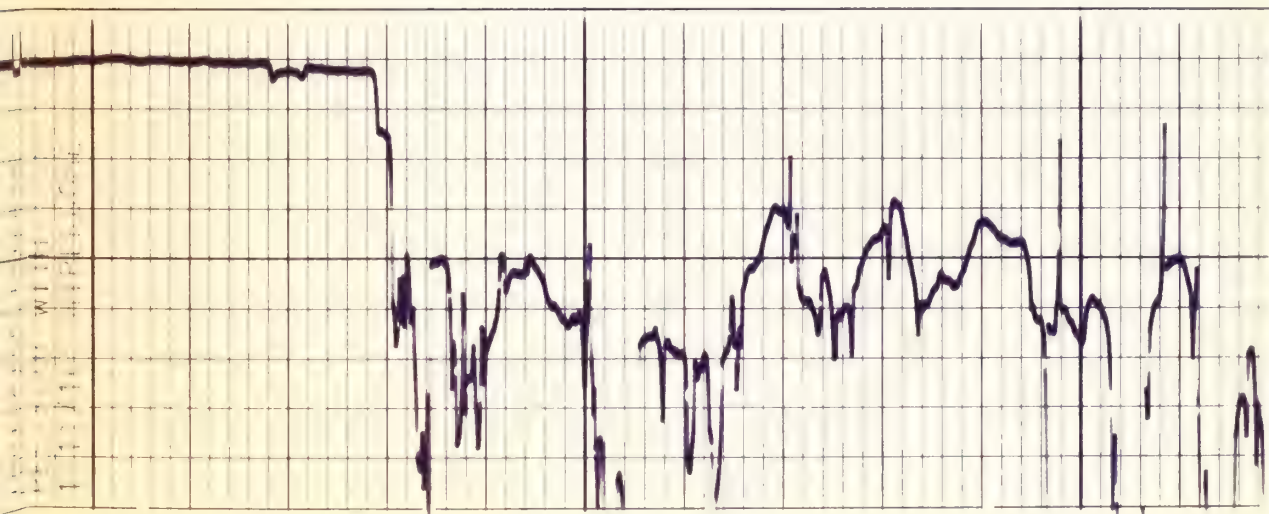
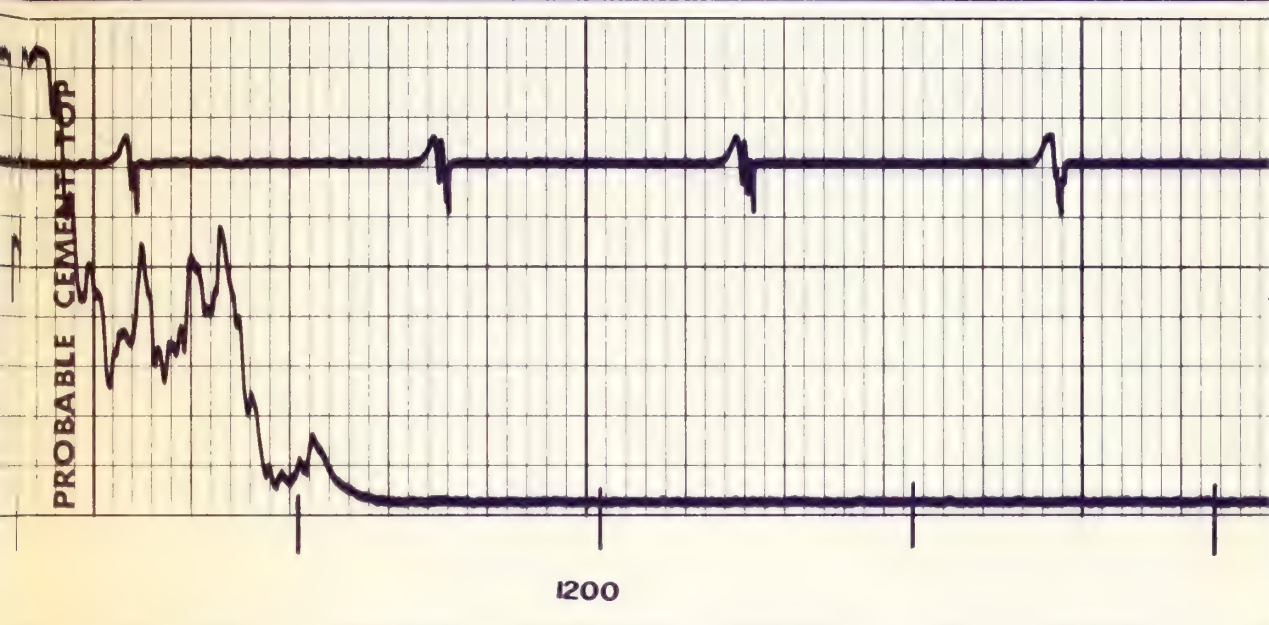
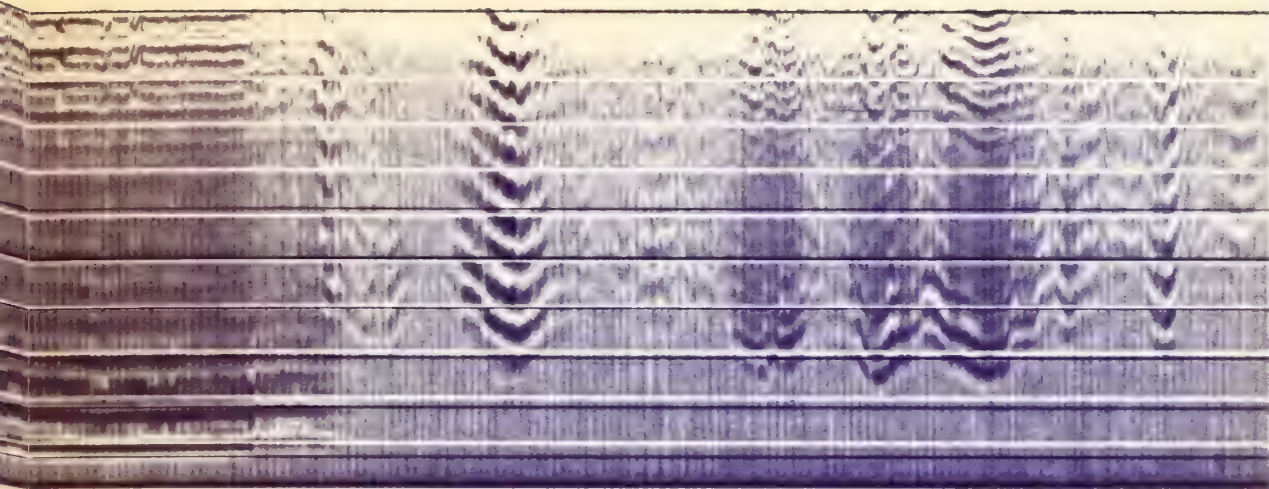
MICROSECONDS _____ SPACING _____

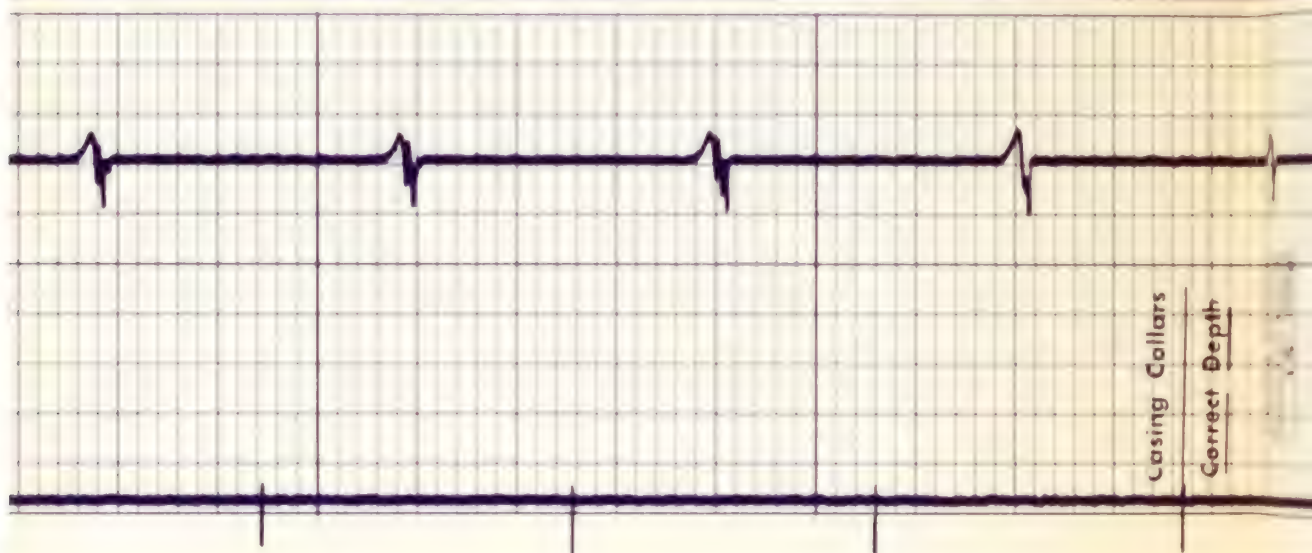
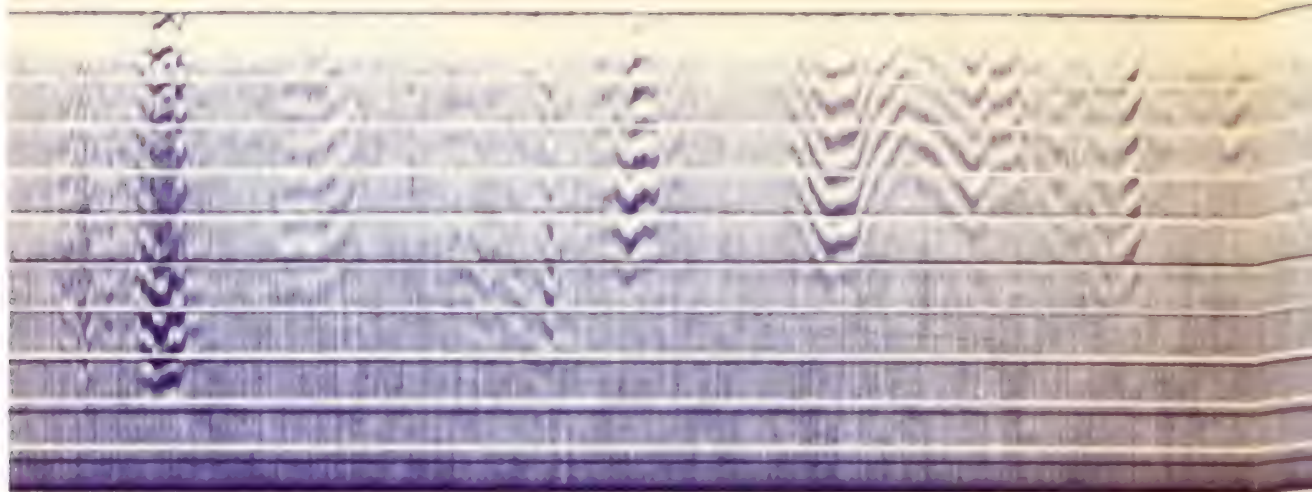
100 100



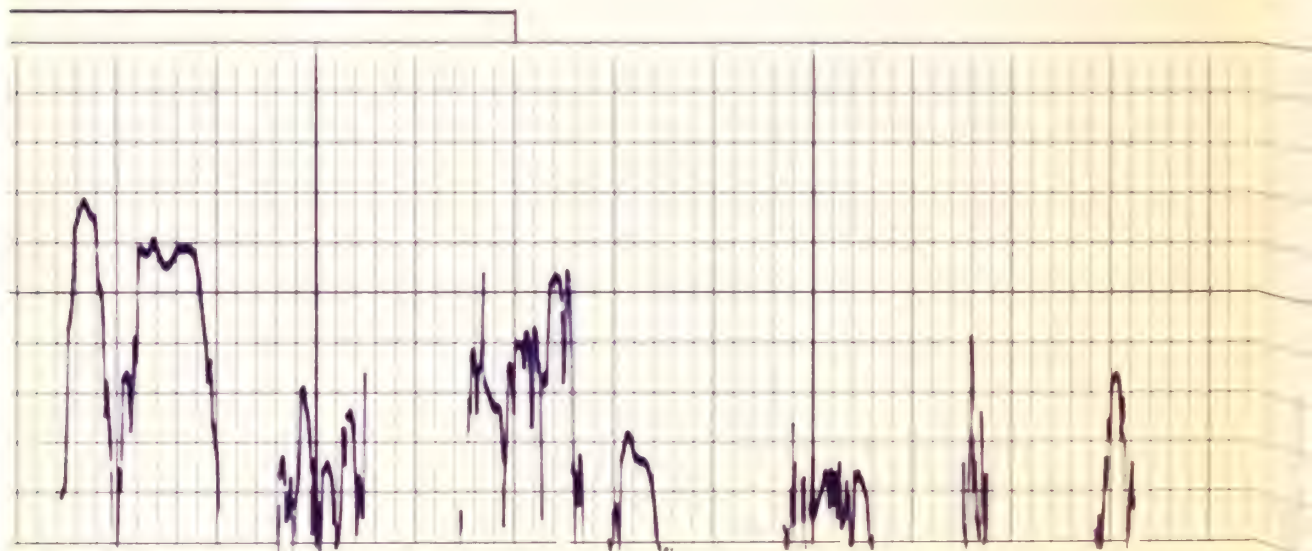


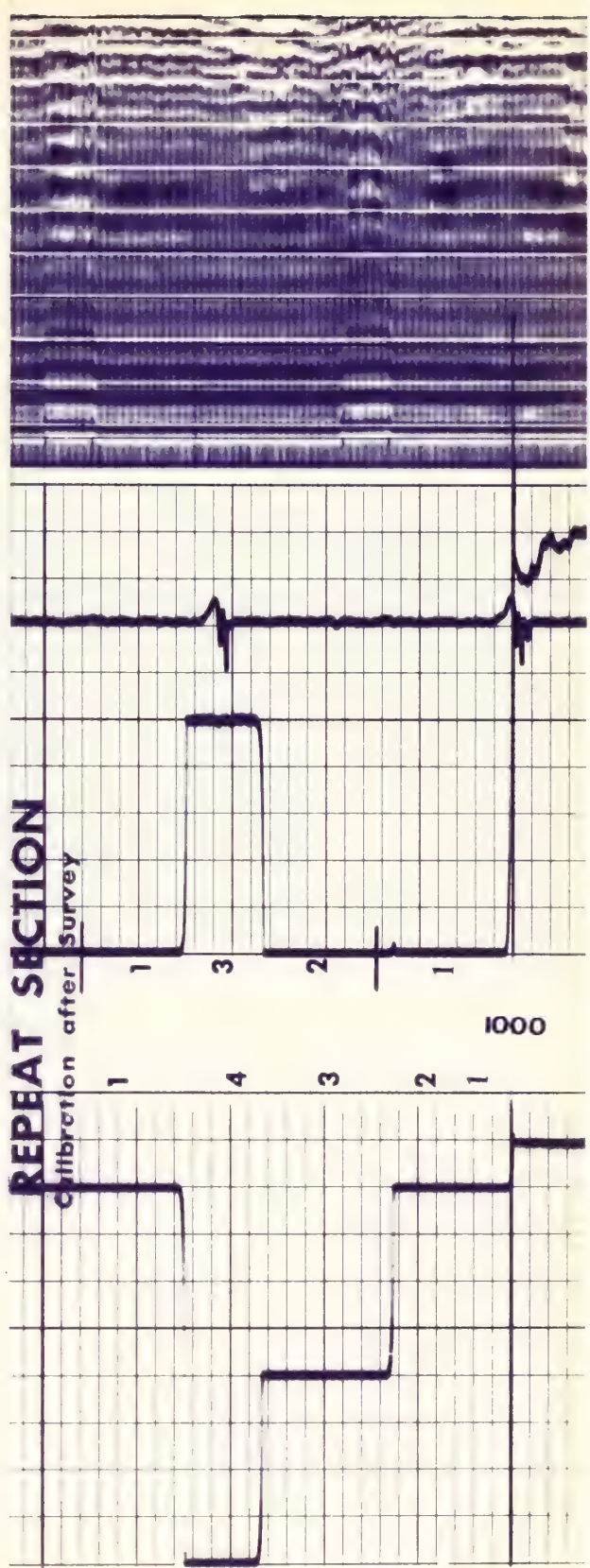
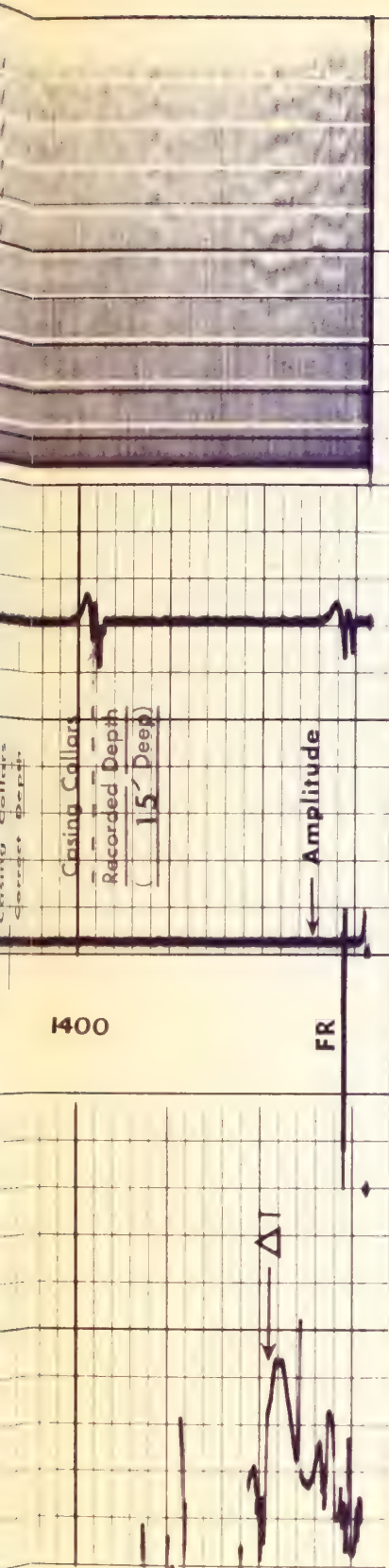
INDICATED INTERVAL

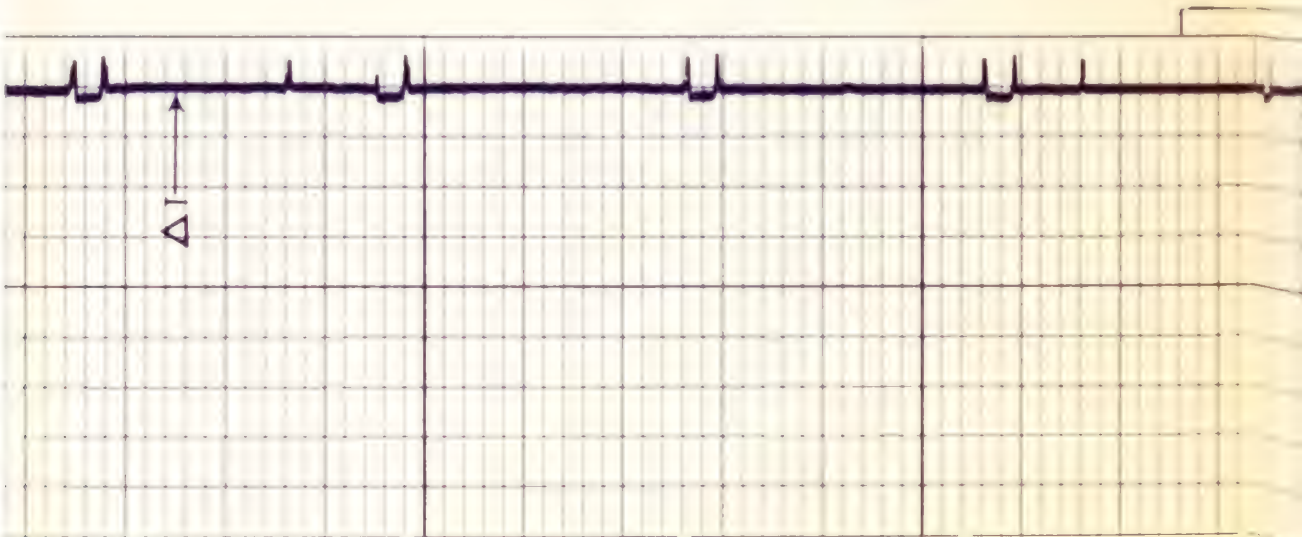
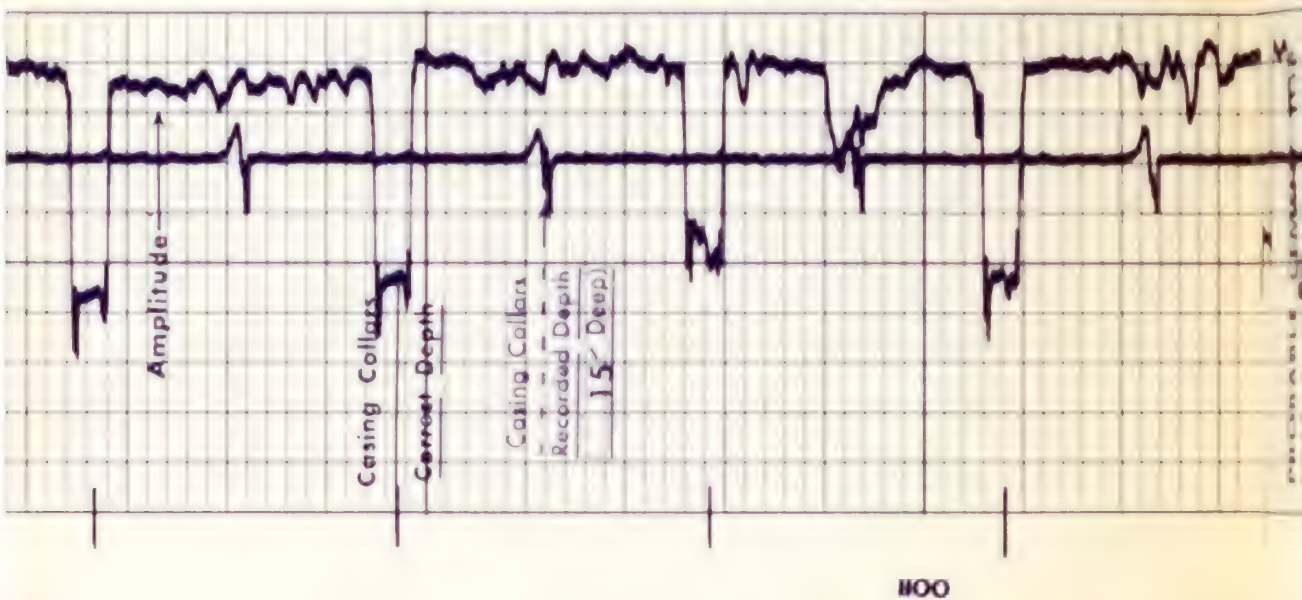
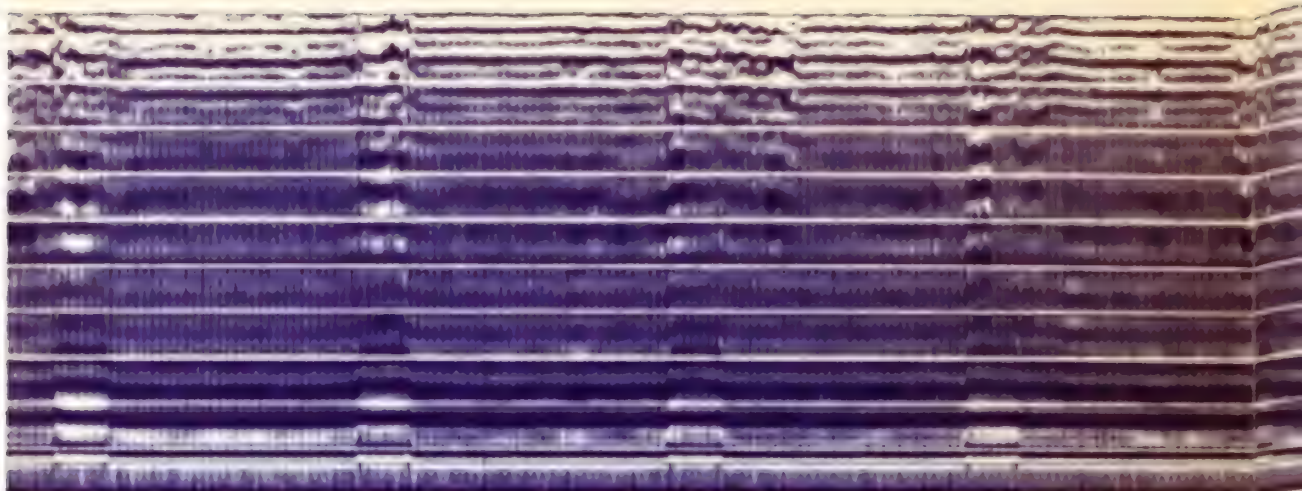


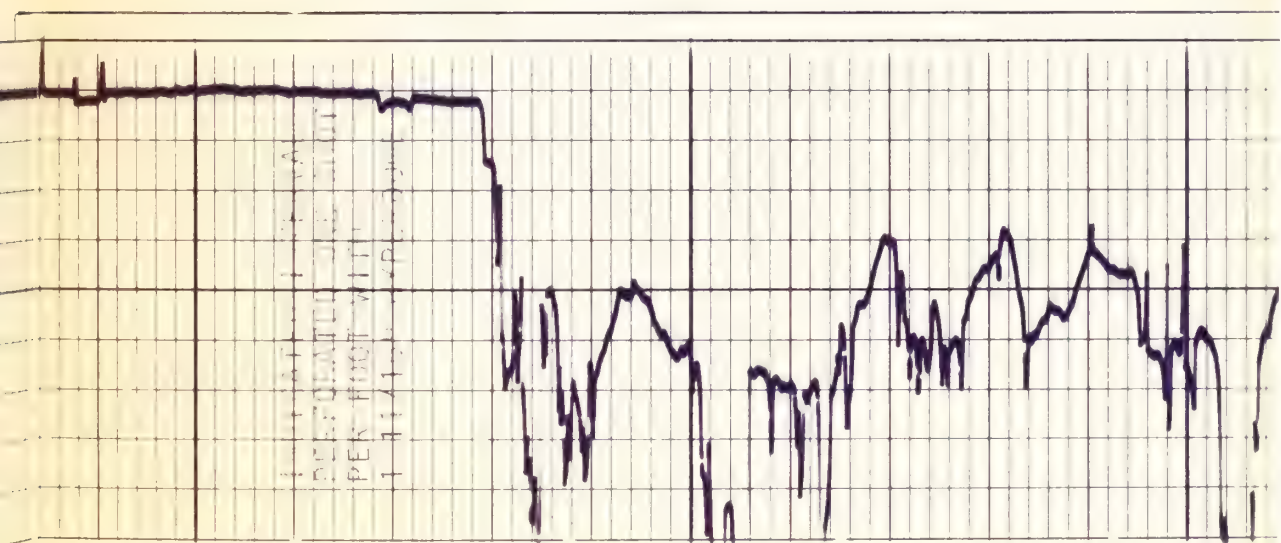
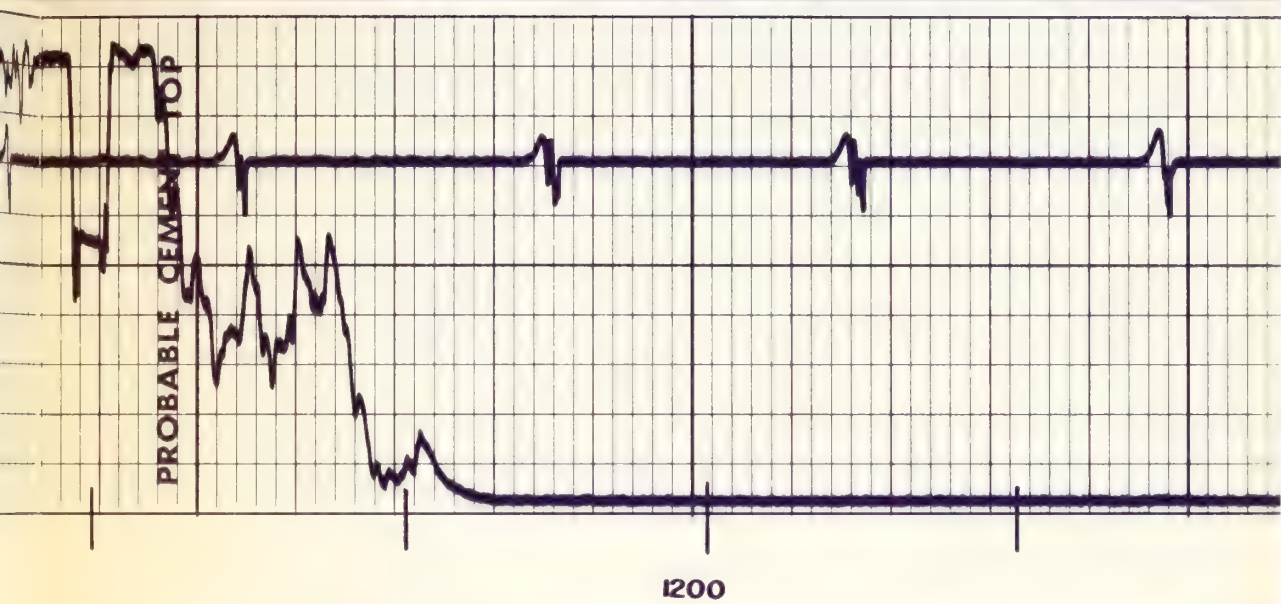
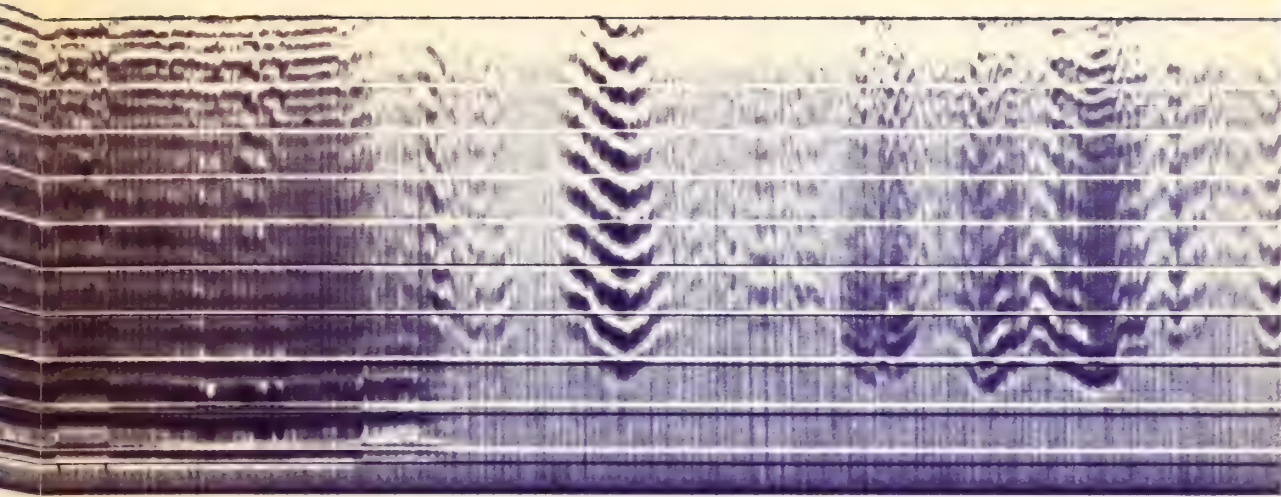


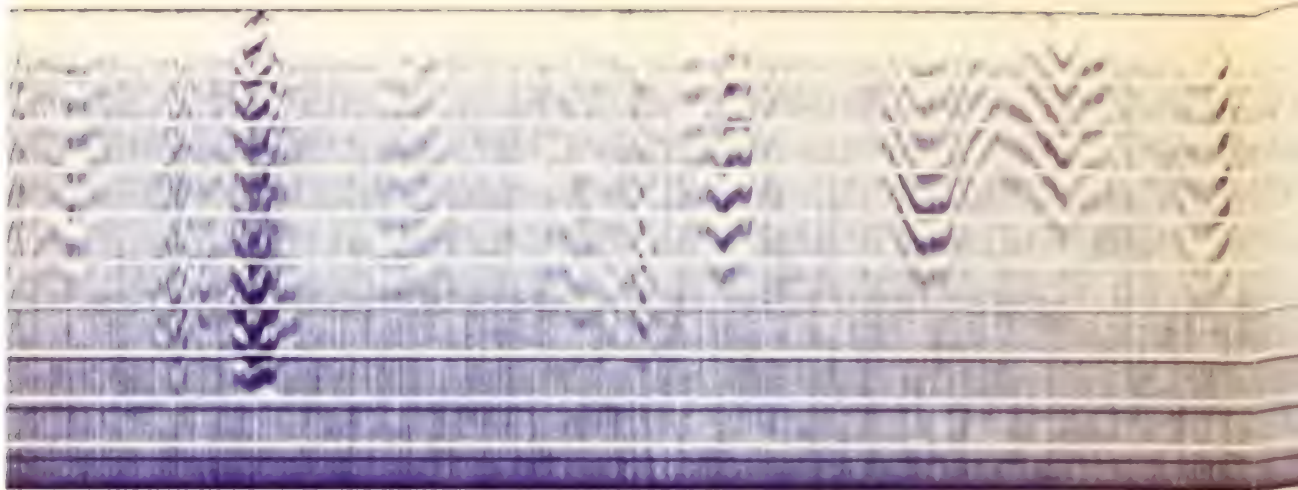
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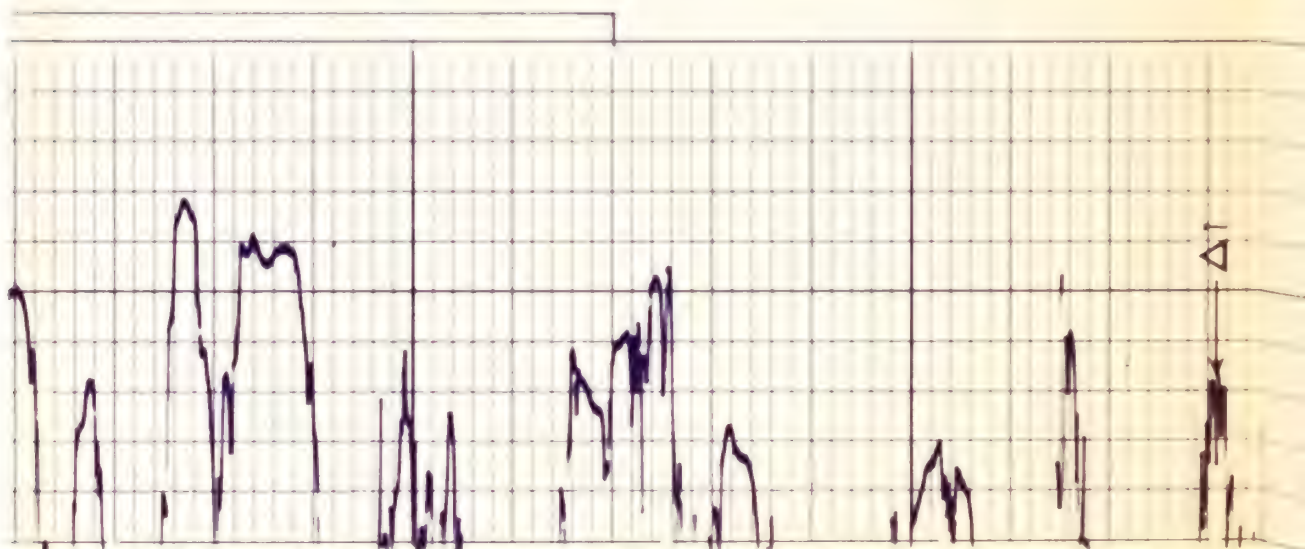


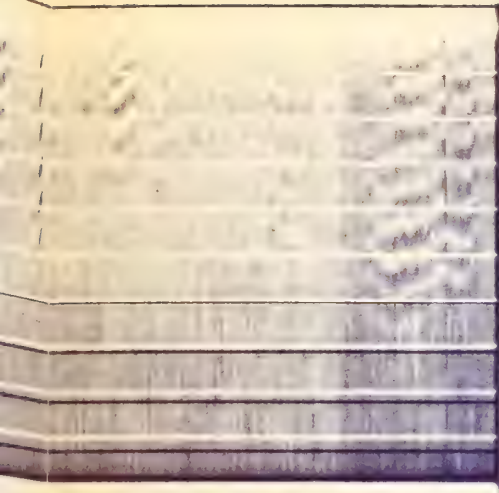






1300





MICROSECONDS _____ SPACING _____ 200
400

0
MILLIVOLTS

MICROSECONDS _____ SPACING _____

ATLANTIC RICHFIELD COMPANY

| | | |
|-------|----|------|
| SCHL. | FR | 1431 |
| SCHL. | TD | 1441 |
| DRLR | TD | 1454 |

| | |
|----|----------|
| KB | 00000000 |
| DF | 00000000 |
| GL | 00000000 |

STATE COLLEGE

CEMENT BOND CALIBRATION CODING

| | Δ f | AMPLITUDE |
|---|-----------------|-----------------|
| 1 | MECHANICAL ZERO | MECHANICAL ZERO |
| 2 | 240 ± 5°C | ELECTRICAL ZERO |
| 3 | 320 ± 5°C | CALIBRATE |
| 4 | 400 ± 5°C | |

Schlumberger

CASING COLLAR LOG AND
PERFORATING RECORD

COUNTY RIO BLANCO

FIELD or

LOCATION

WELL CB-2

COMPANY ATLANTIC RICHFIELD
COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL CB-2

FIELD

COUNTY RIO BLANCO STATE COLORADO

Location:

1589' FSL & 1300 FEL

Sec. 6 Twp. 3S Rge. 96W

Other Services:

CBL-VDL
PDC-GR

Permanent Datum: GROUND LEVEL; Elev.: 6737
Log Measured From G.L., 0 Ft. Above Perm. Datum
Drilling Measured From G.L.

Elev.: K.B. -----
D.F. -----
G.L. 6737

Date 10-15-74

Run No. ONE

PLUG BACK TOTAL DEPTH DRILLER- 1454 LOGGER-

DEPTHS BELOW RELATE TO: OPEN HOLE LOG MEASUREMENTS: ☐: RADIOACTIVITY LOG MEASUREMENTS: ☒: SCHLUMBERGER LINE MEASUREMENTS: ☐

CASING COLLARS

PERFORATING DATA

| | | No. Shots | From | To | Gun Type | Gun Size |
|------|------|-----------|------|------|-----------|----------|
| 1130 | 1.93 | 135 | 1126 | 1320 | HYPERDOME | 1 11/16" |
| 1160 | 1324 | | | | | |
| 1200 | 1355 | | | | | |
| 1231 | 1385 | | | | | |
| 1262 | 1416 | | | | | |

BORE HOLE RECORD

CASING RECORD

| Hole Size | From | To | Size | Type | Weight | From | To |
|-----------|------|----|-------|------|--------|------|------|
| 4 3/4 | SURF | TD | 2 3/3 | | 4.2 | SURF | 1465 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

HOLE FLUID DATA

Type Fluid: WATER

Density: -----

Fluid Level: -----

Opr. Rig Time: 36 HOURS

Truck No. 36

Location: VICTORIA

Recorded By: T. AUDY

Witnessed By: R. E. ARL

The well name, location and borehole reference data were furnished by the customer.
FOLD HERE

REMARKS

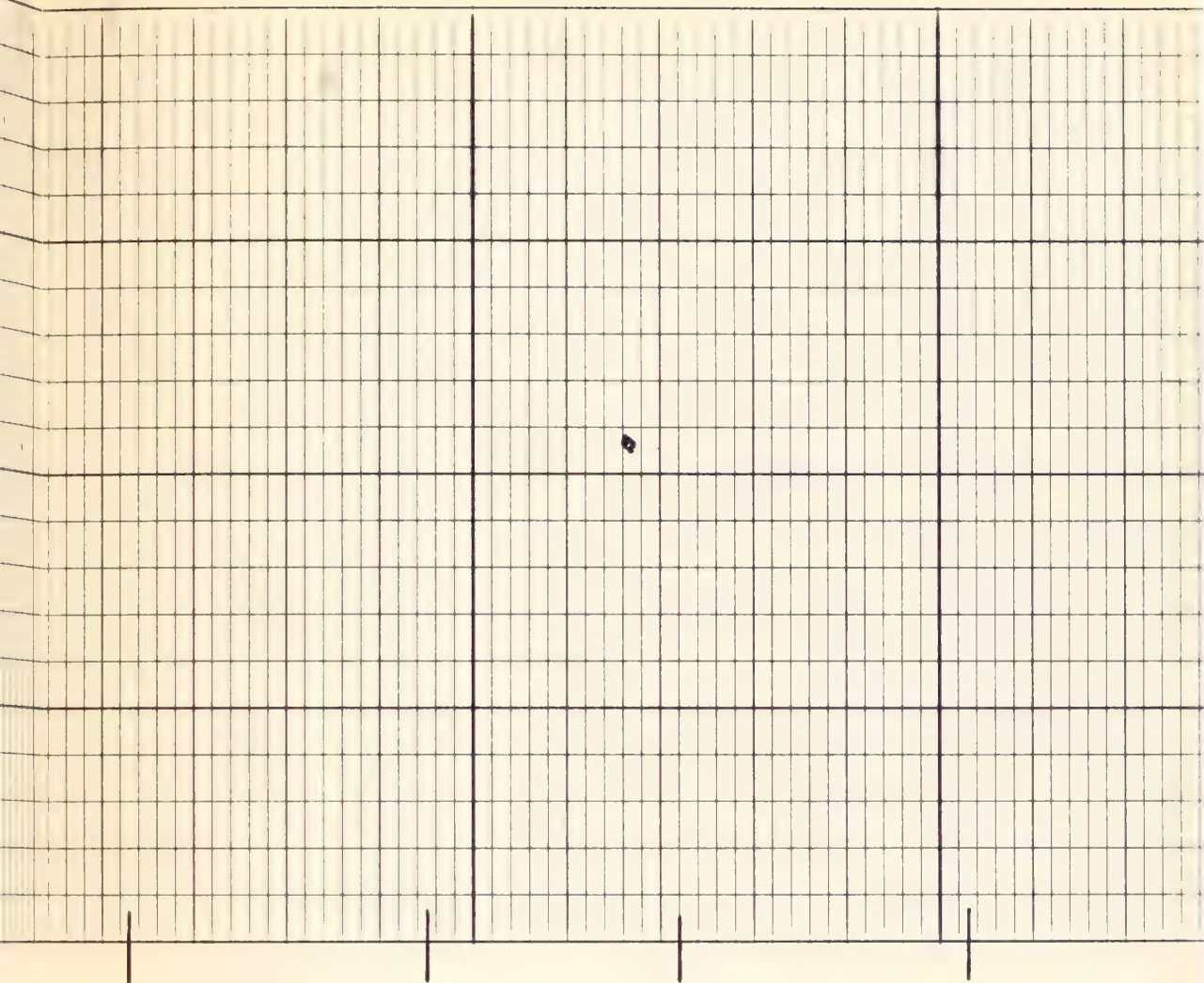
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Service Order No. 4737

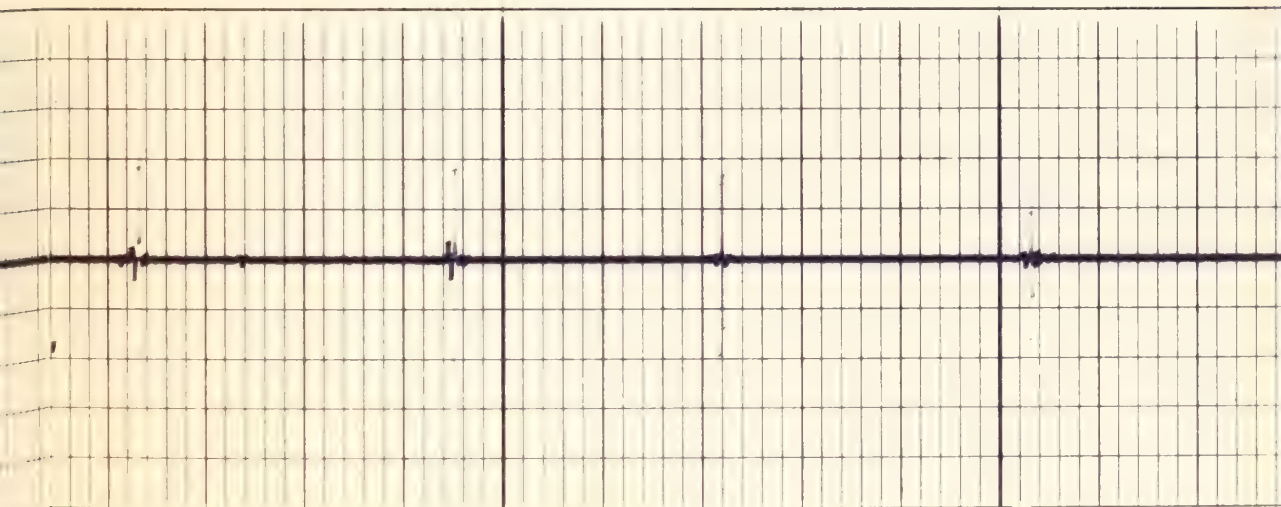
DEPTHS

CASING COLLAR LOG
BEFORE PERFORATION

0800



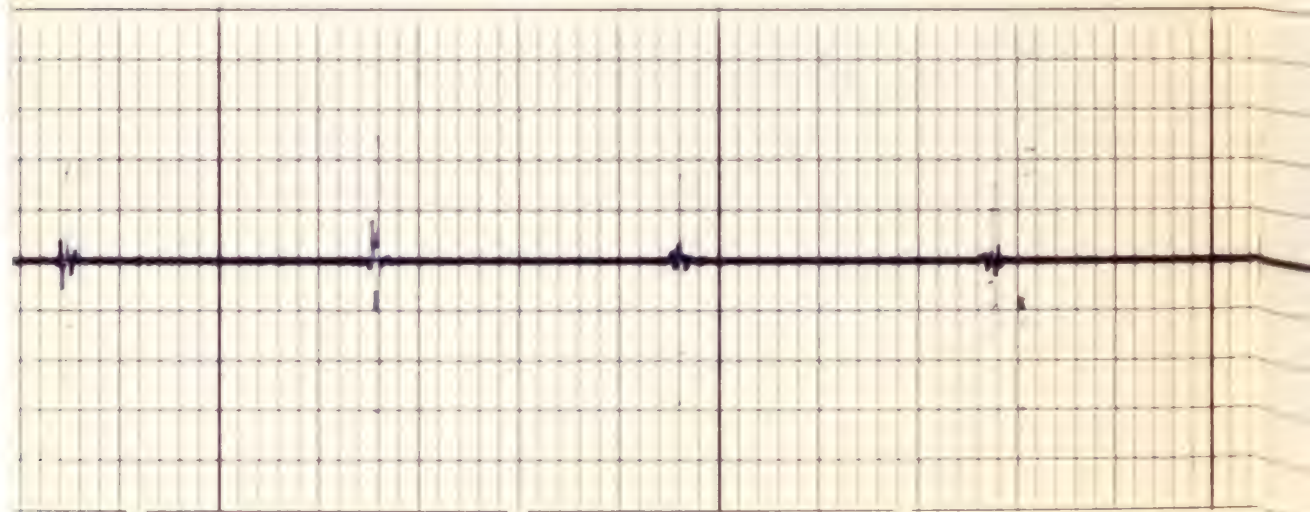
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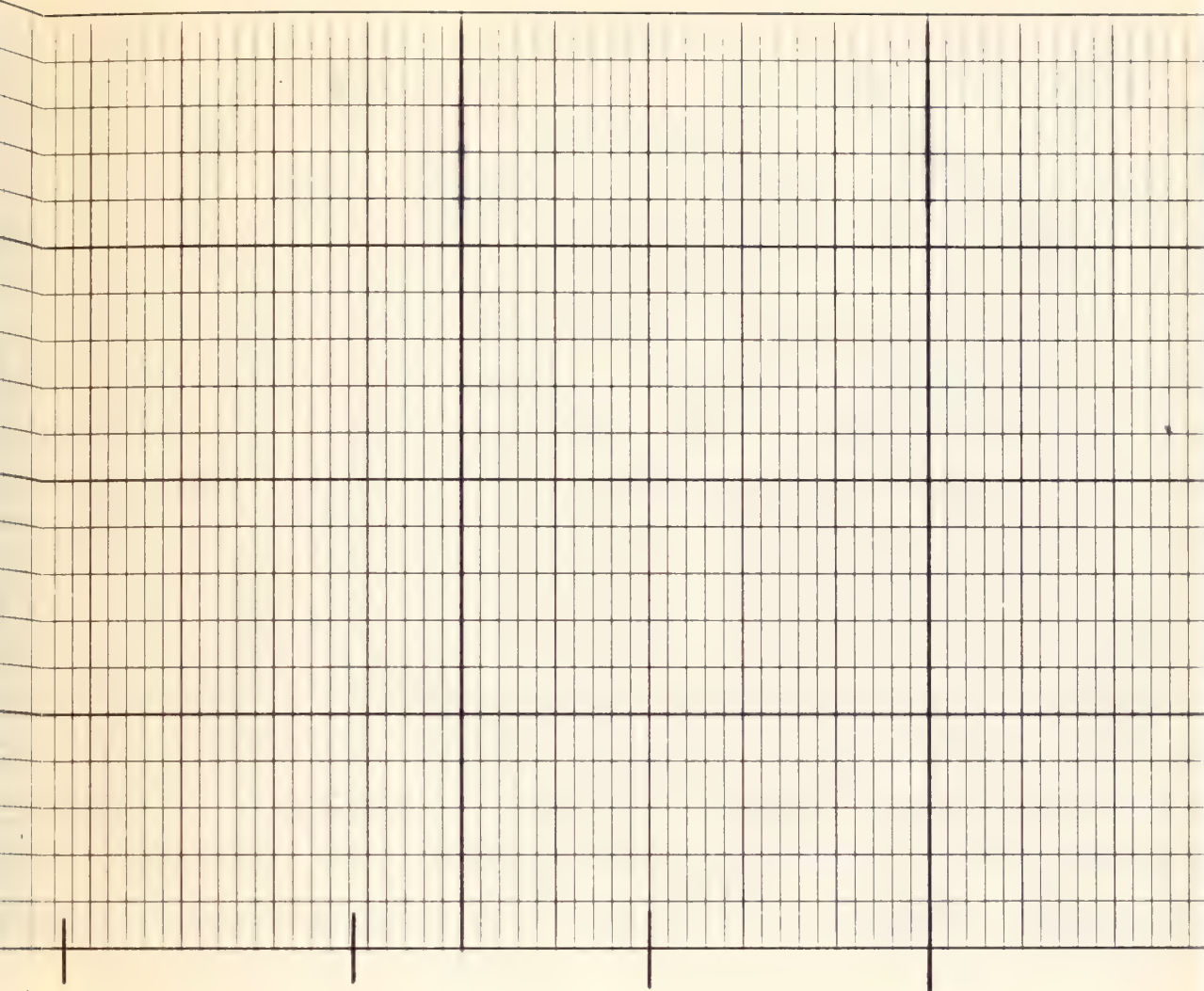




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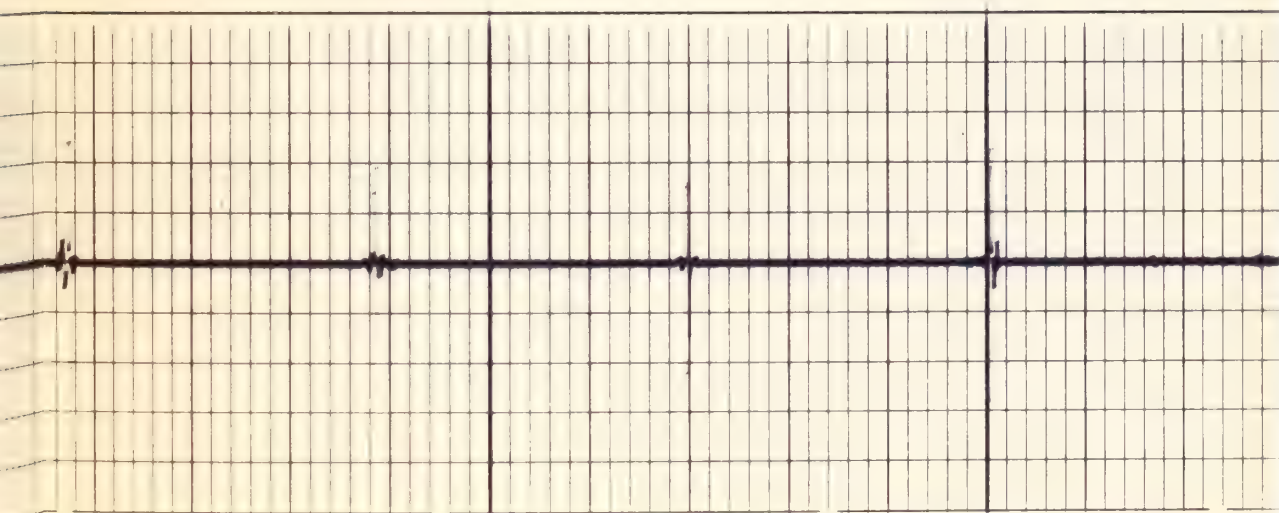
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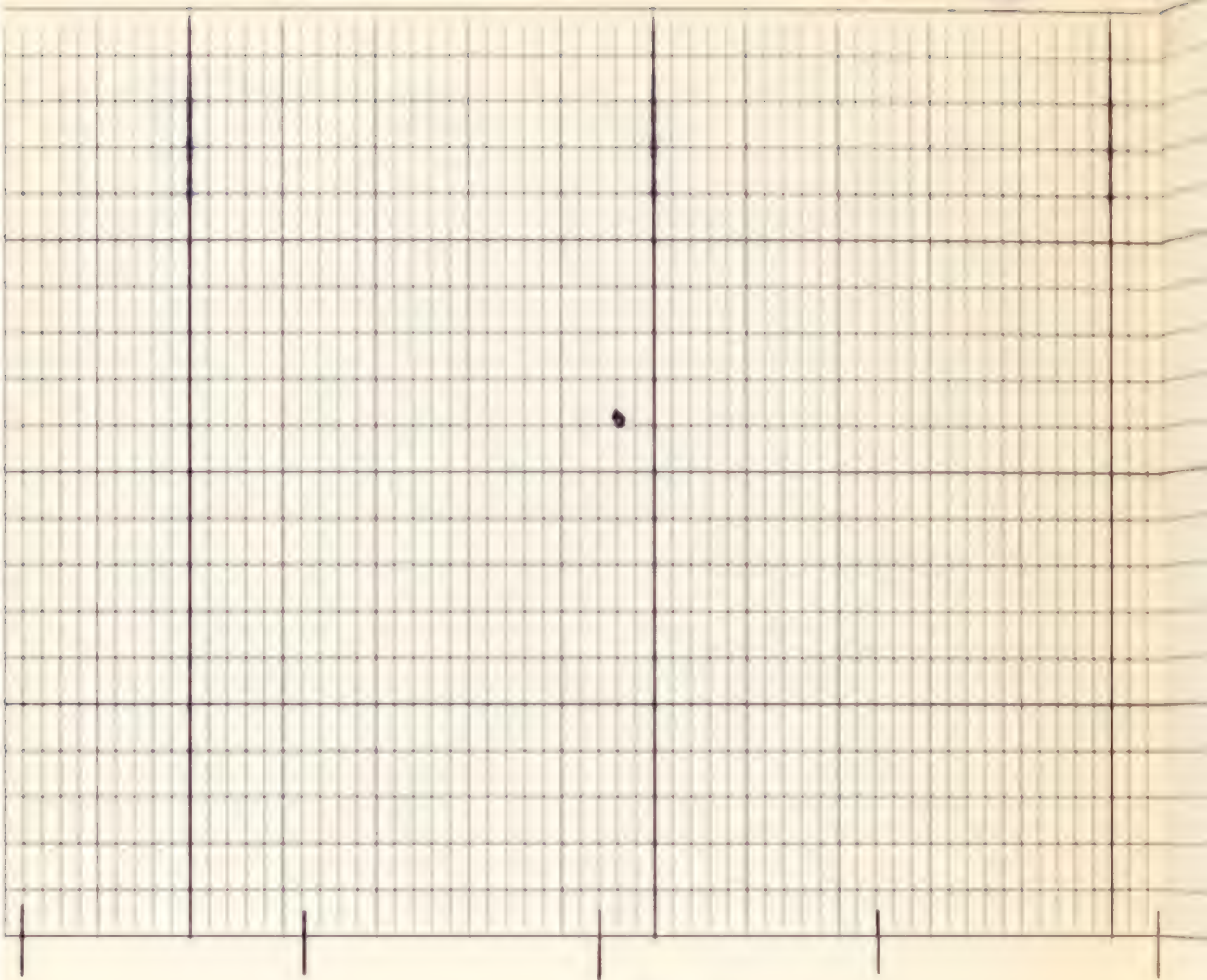




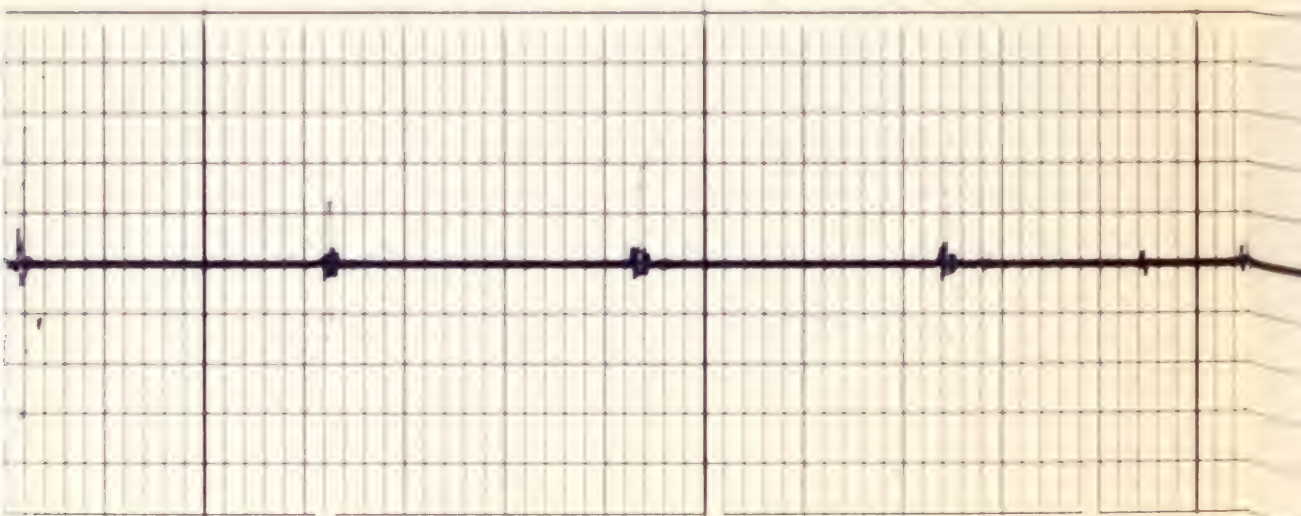
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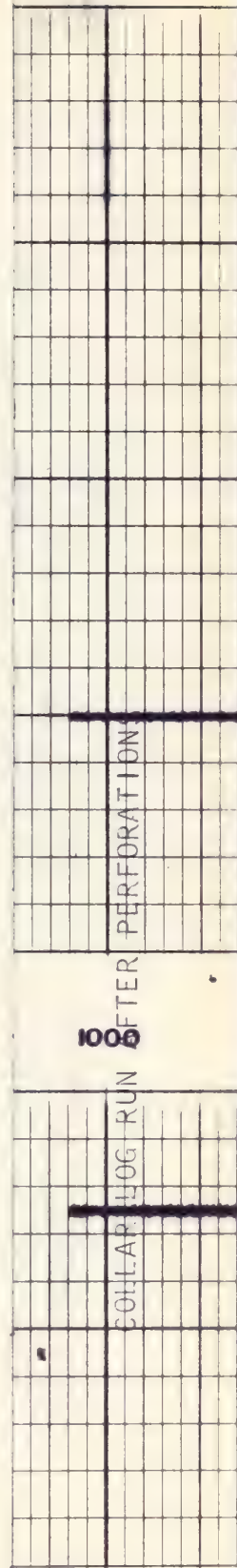
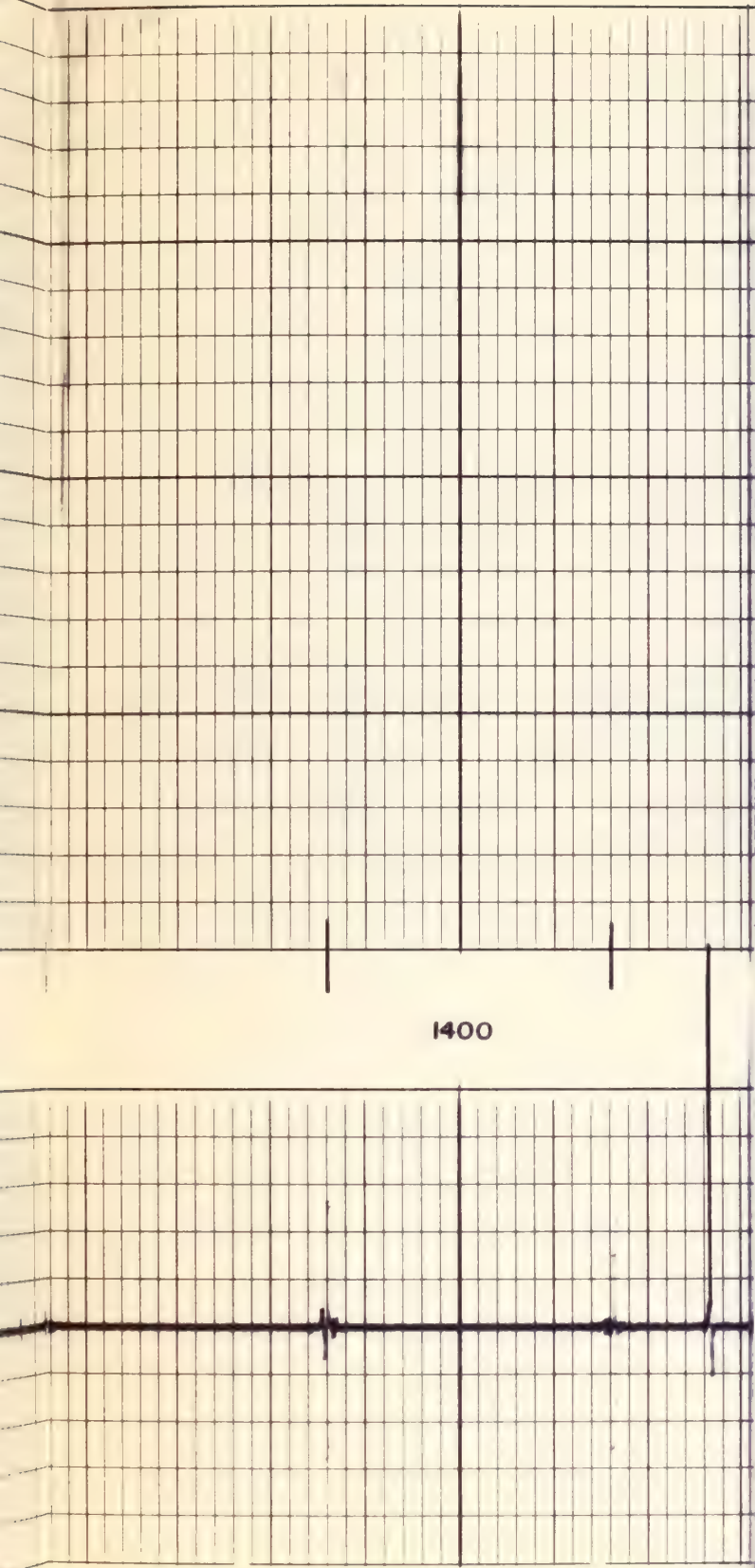
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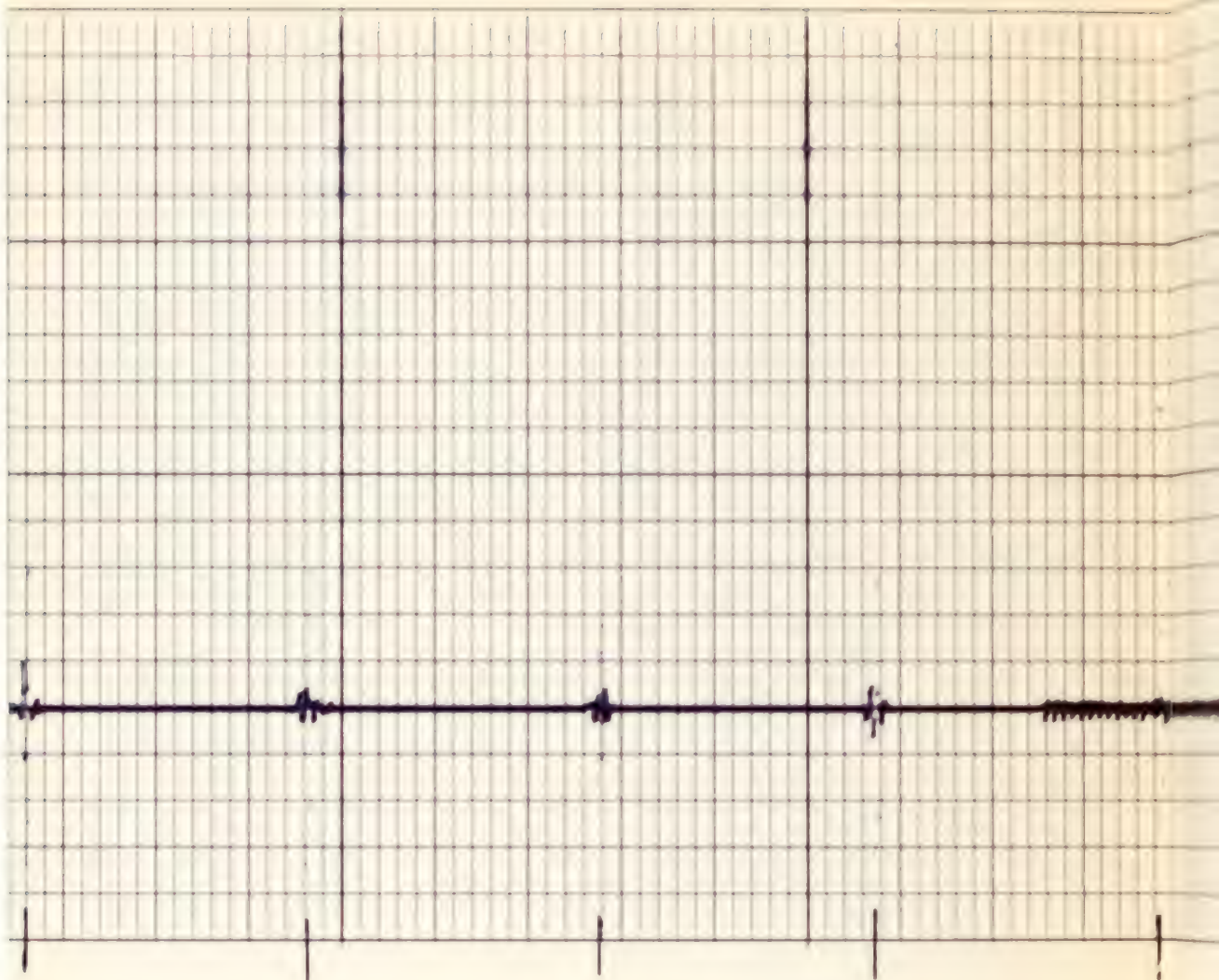


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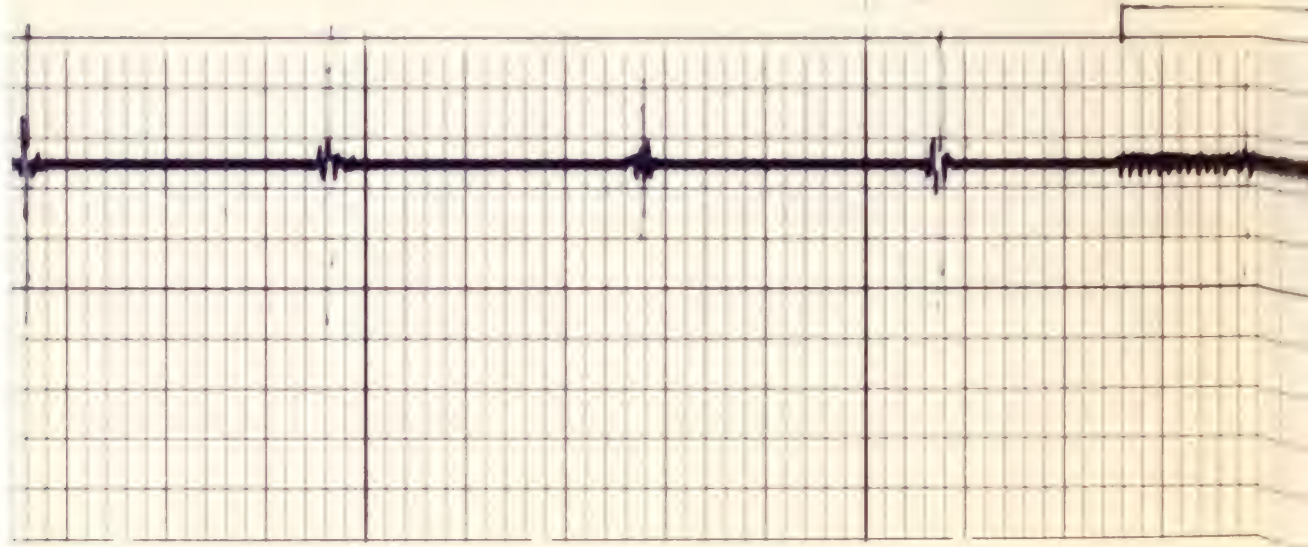


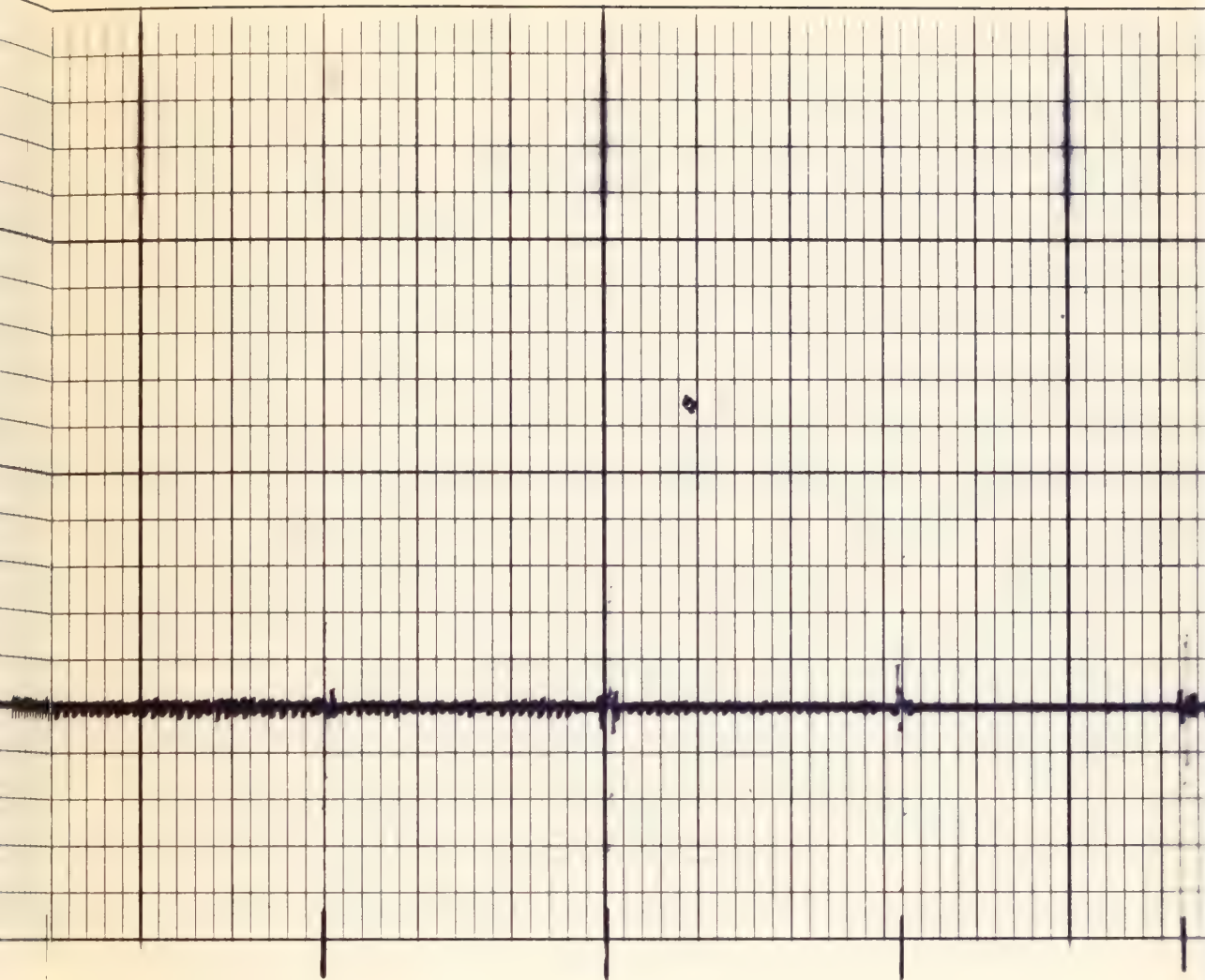


COLLAR LOG RUN AFTER PERFORATION

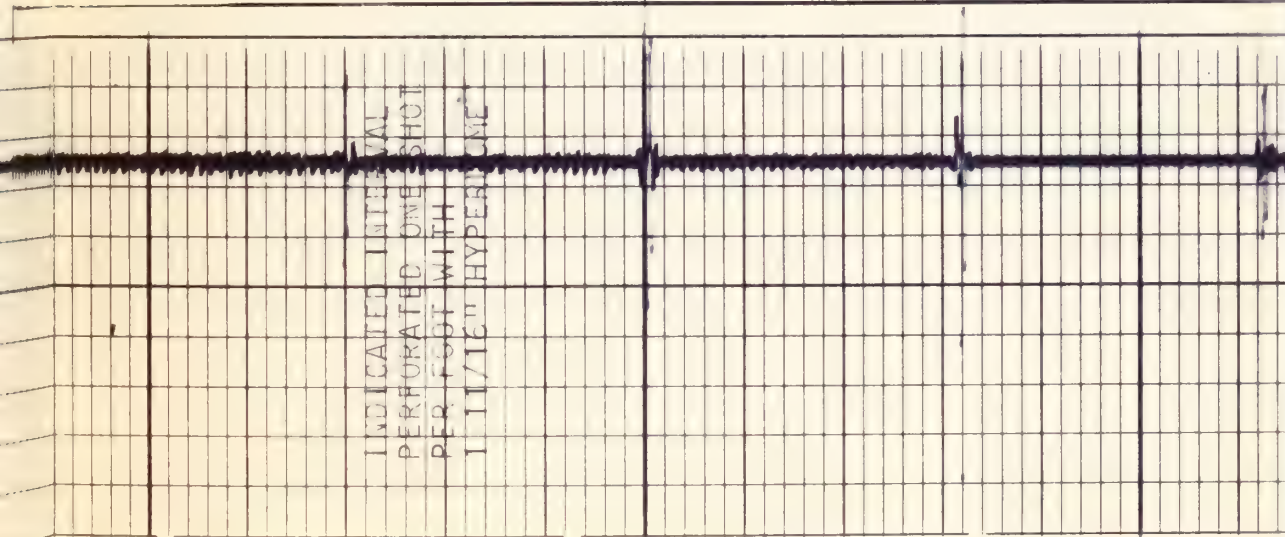


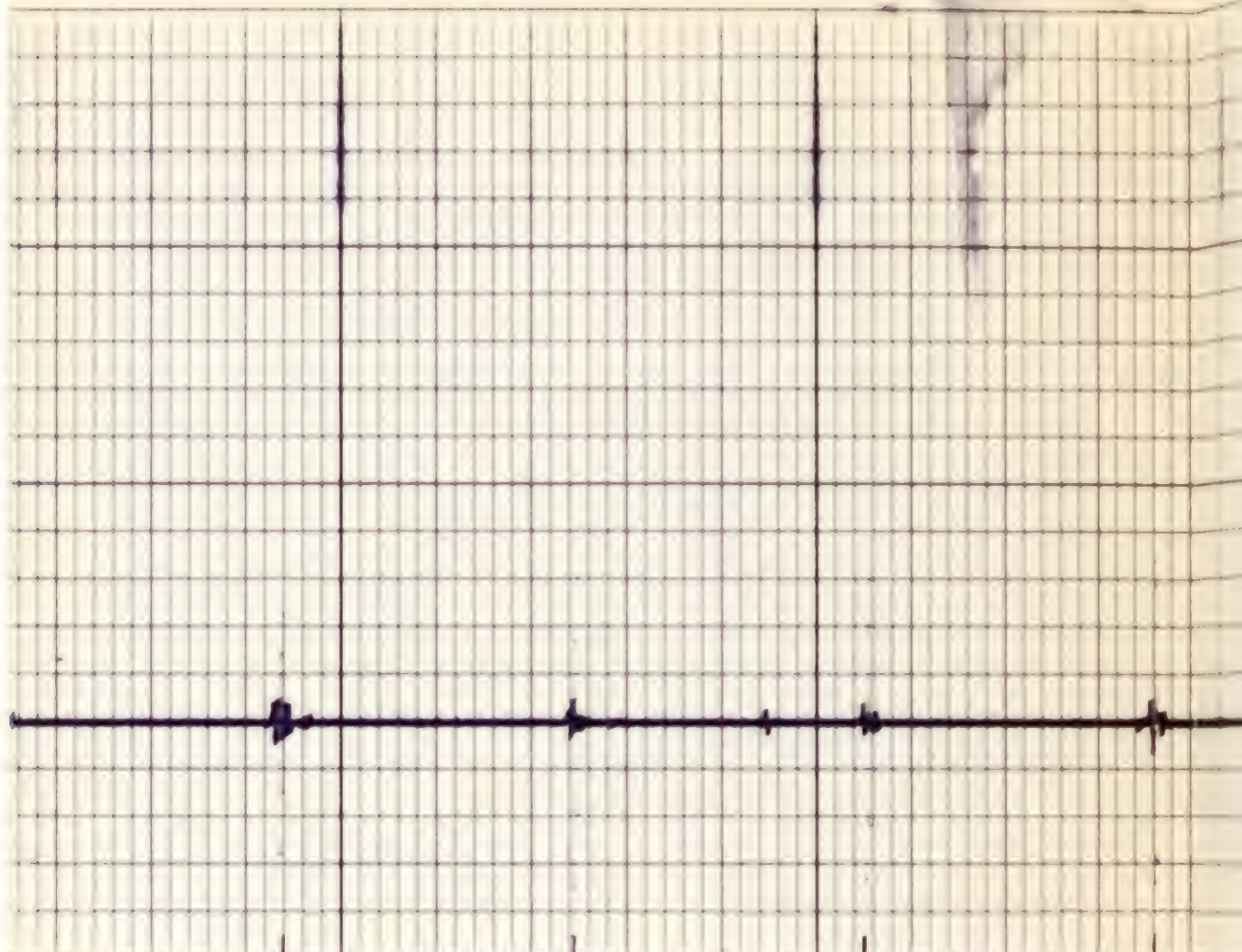
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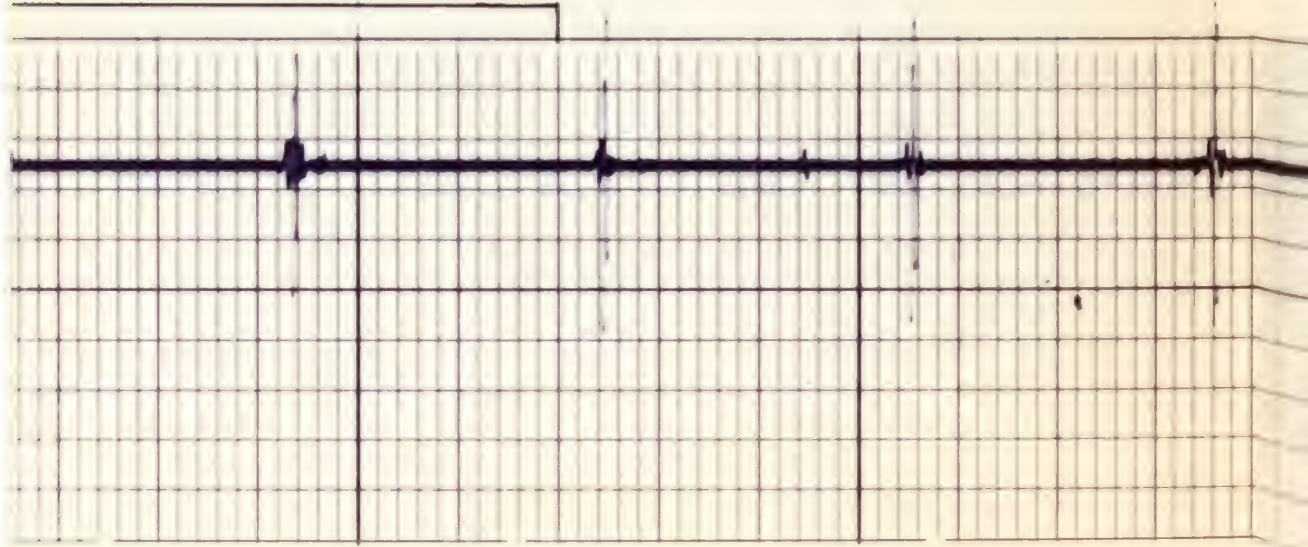


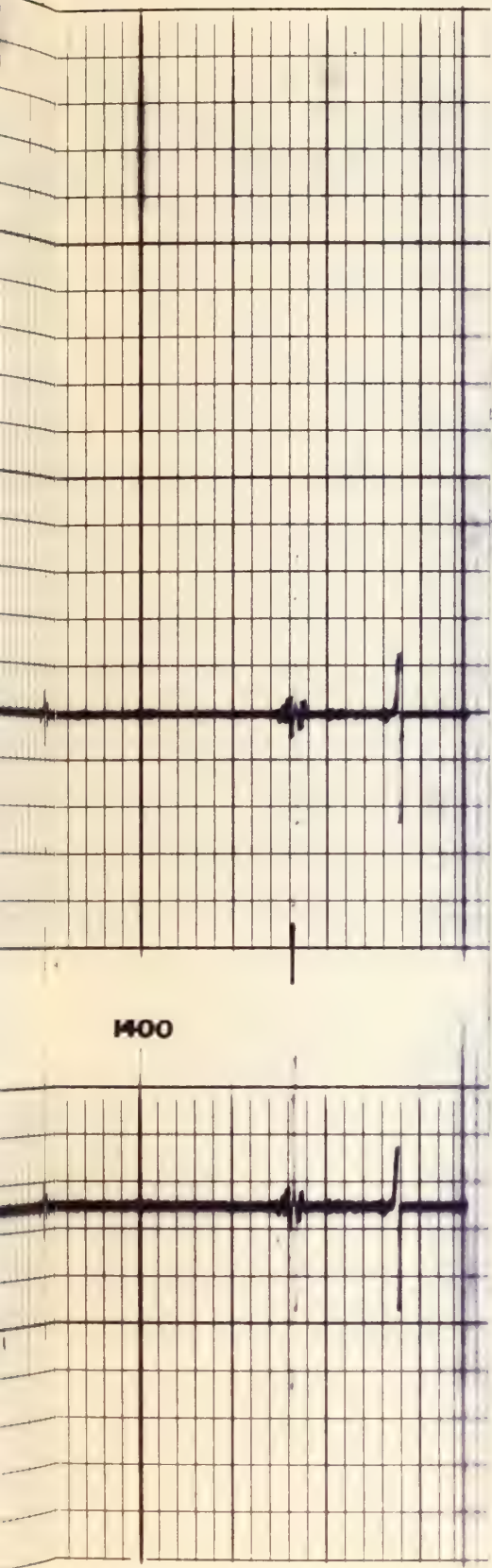
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300





| DEPTHS | | CASING COLLAR LOG AFTER PERFORATION | |
|---------|----------------------------|--|---------------------------------------|
| COMPANY | ATLANTIC RICHFIELD COMPANY | | SCHL. TD _____ DRLR TD _____ |
| WELL | _____ | | Elev: KB _____ DF _____ GL 6737 |
| FIELD | _____ | | |
| COUNTY | RIO BLANCO STATE COLORADO | | |

Schlumberger**PERFORATING DEPTH CONTROL**

COUNTY RIO BLANCO

FIELD or

LOCATION

WELL CB-2

COMPANY ATLANTIC RICHFIELD COMPANY

COMPANY ATLANTIC RICHFIELD COMPANY

WELL CB-2

FIELD

COUNTY RIO BLANCO STATE COLORADO

Location

1589' FSL & 1300' FEL

Sec. 6 Twp. 3S Rge. 96W

Other Services:

CBL-VDL
SPHPermanent Datum: GROUND LEVEL; Elev.: 6737
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GLElev.: K.B. ----
D.F. ----
G.L. 6737

| | |
|-------------------------|------------|
| Date | 10-14-74 |
| Run No. | ONE |
| Type Log | GAMMA RAY |
| Depth — Driller | 1454 |
| Depth — Logger | 1441 |
| Bottom logged interval | 1430 |
| Top logged interval | 1000 |
| Type fluid in hole | WATER |
| Salinity, PPM Cl. | ----- |
| Density | ----- |
| Level | FULL |
| Max. rec. temp., deg F. | ----- |
| Operating rig time | ONE HOUR |
| Recorded By | ST. AULYN |
| Witnessed By | MR. ELLARD |

BORE-HOLE RECORD

| Bit Size | From | To |
|----------|------|----|
| 4 1/4 | SURF | TD |

CASING RECORD

| Size | Wgt. | From | To |
|-------|------|------|------|
| 2 3/8 | 4.7 | SURF | 1460 |

FIELD NAME

THE ABOVE INFORMATION AND BUREAU REFERENCE DATA WERE OBTAINED BY THE ABOVE

EQUIPMENT DATA

Gamma Ray

| | |
|----------------|----------|
| Run No. | DIE |
| Tool Model No. | GNT-6 |
| Diameter | 1 11/16" |
| De'r Model No. | SGD-H |
| Type | SCINT |
| Length | 8" |
| S. O. No. | 49227 |

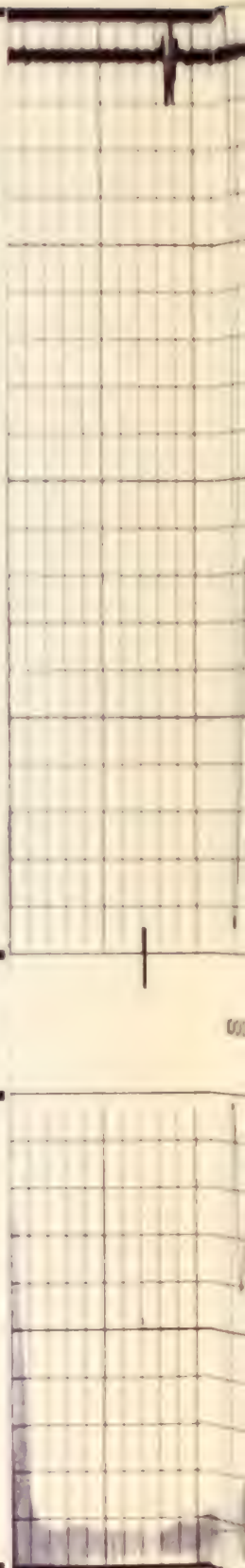
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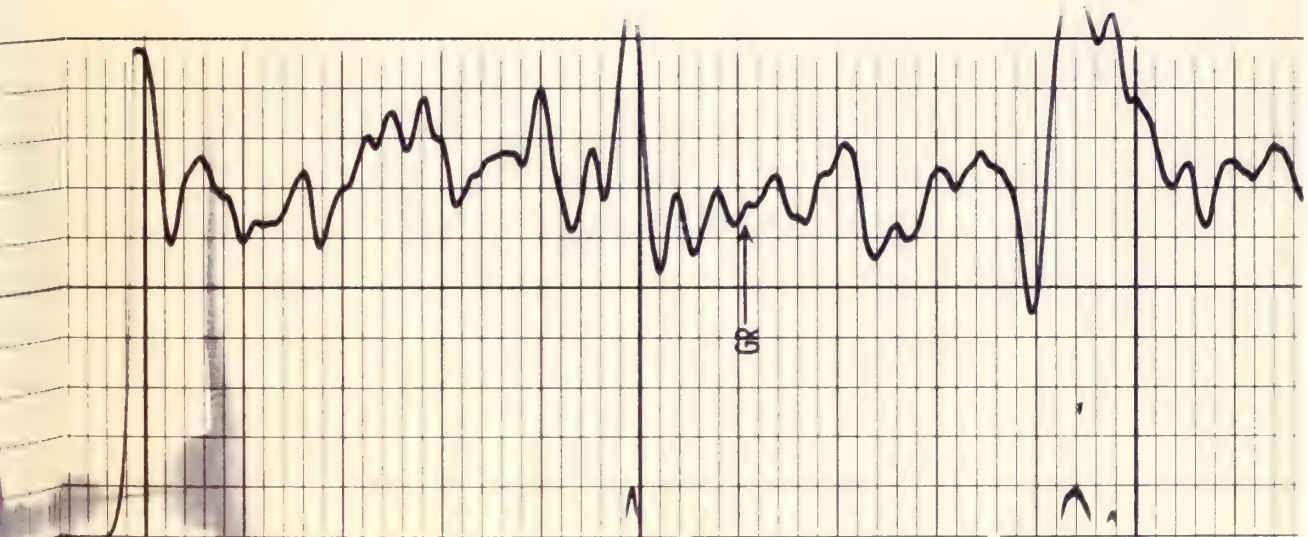
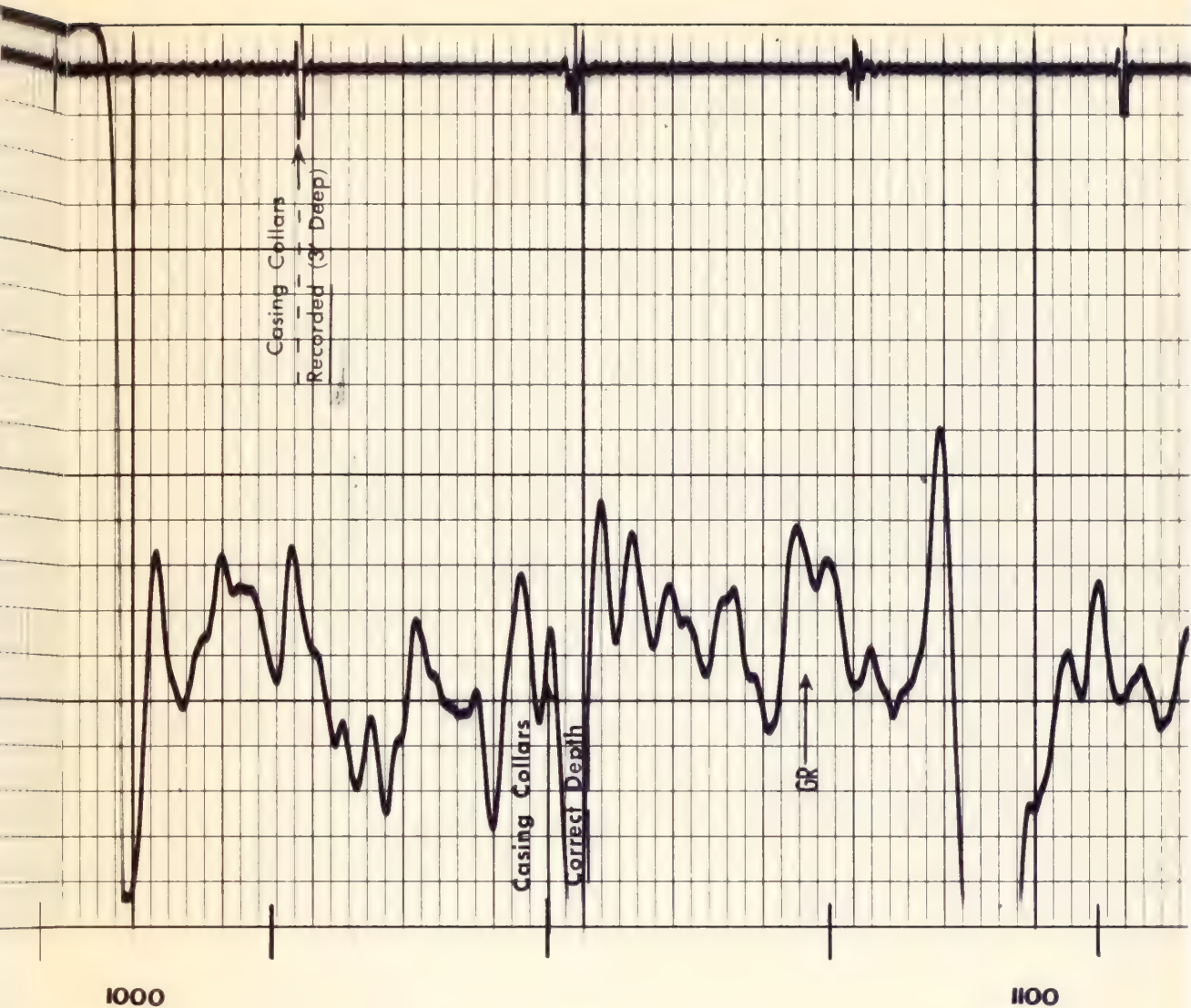
| | |
|-----------------|------|
| Hoist Truck No. | 1262 |
| Inst. Truck No. | 3162 |
| Tool Serial No. | 10 |
| Location | UTAH |

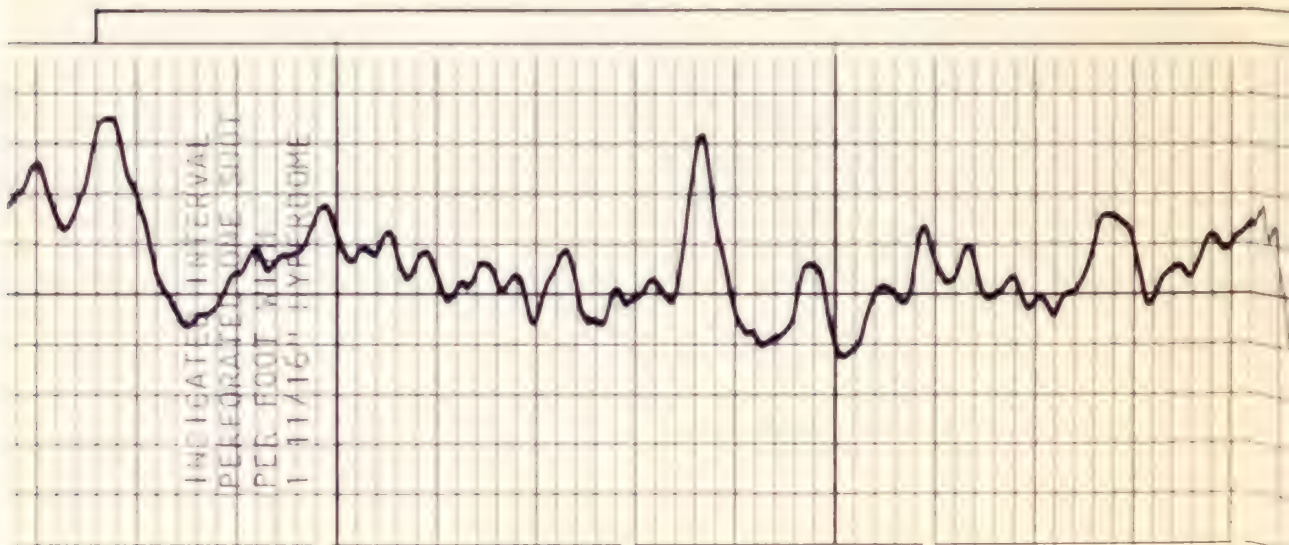
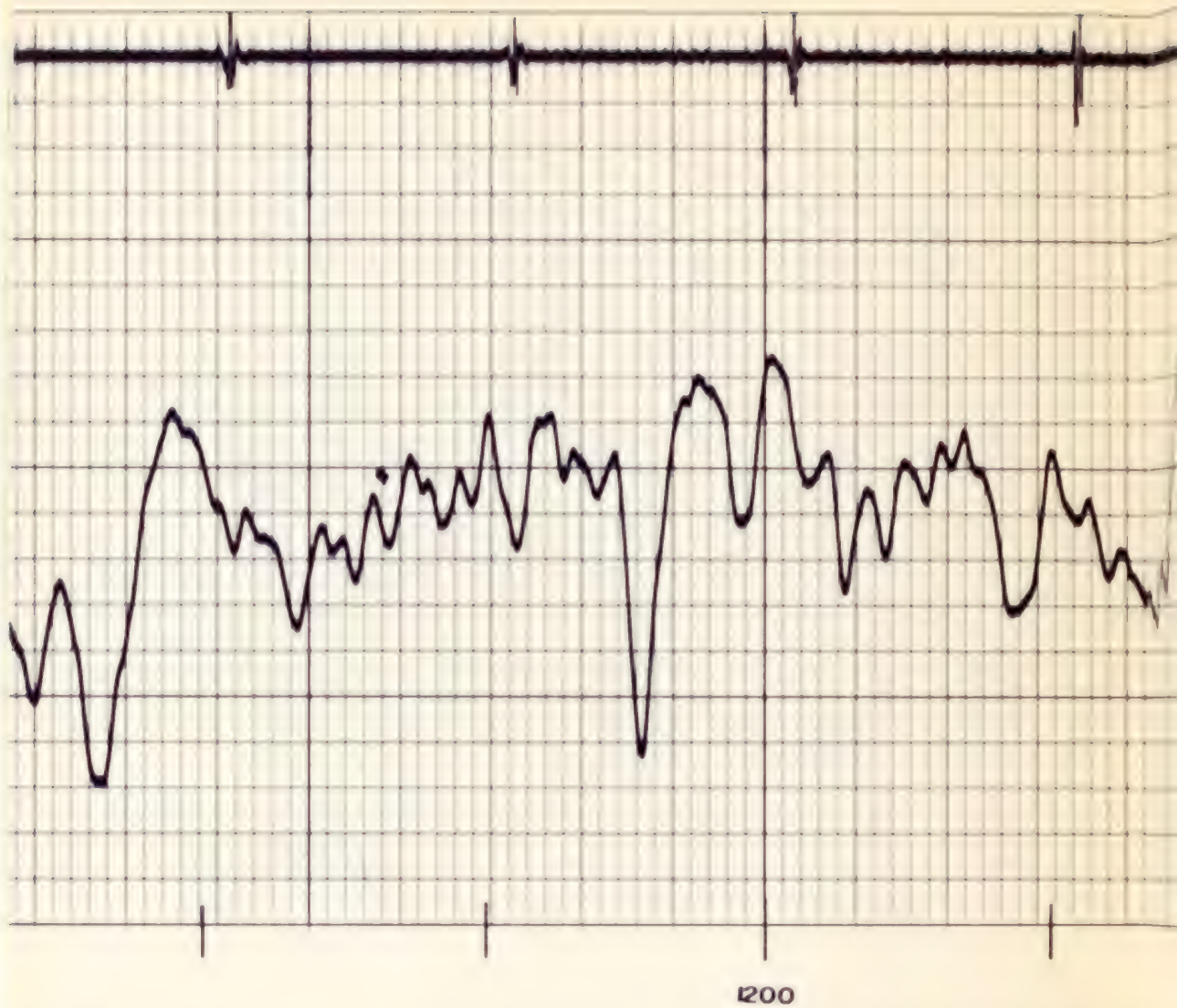
Remarks: Casing Collars recorded 3 ft. deep

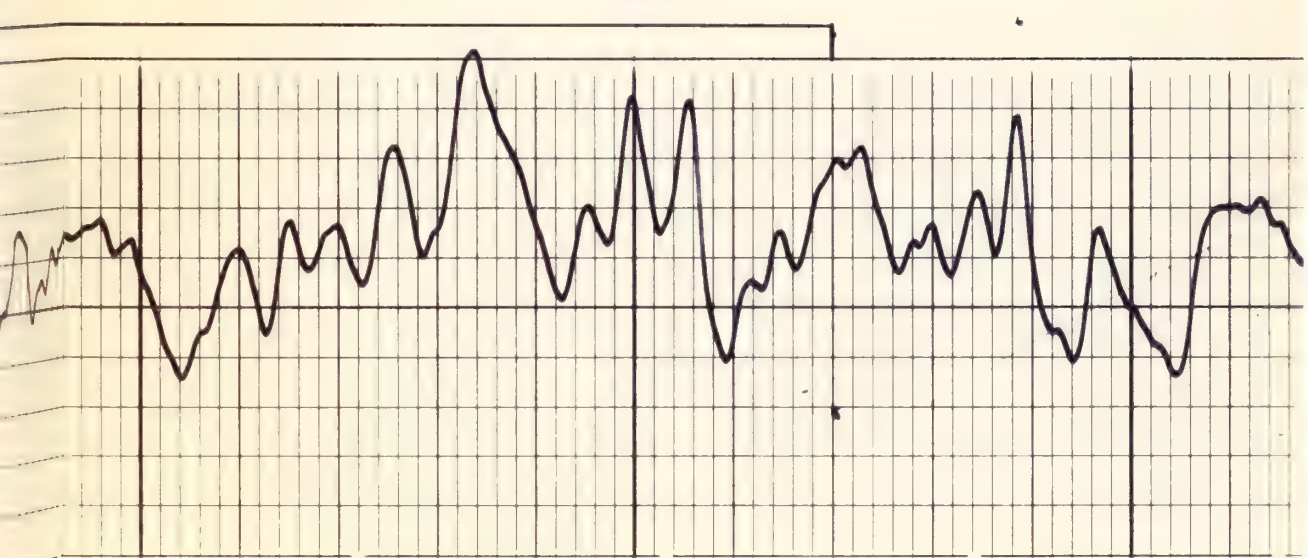
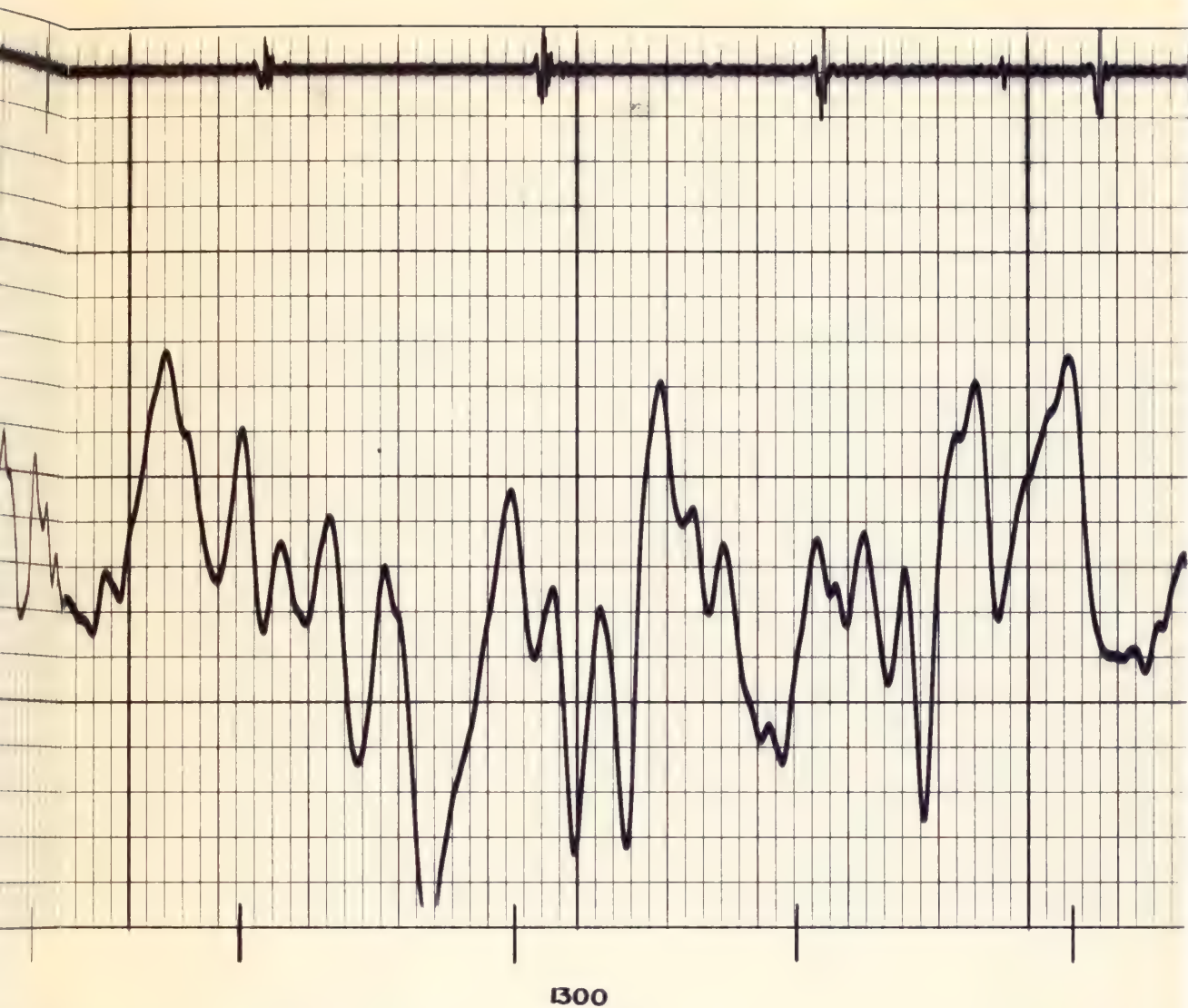
, Corrected collar depths are shown in the depth track

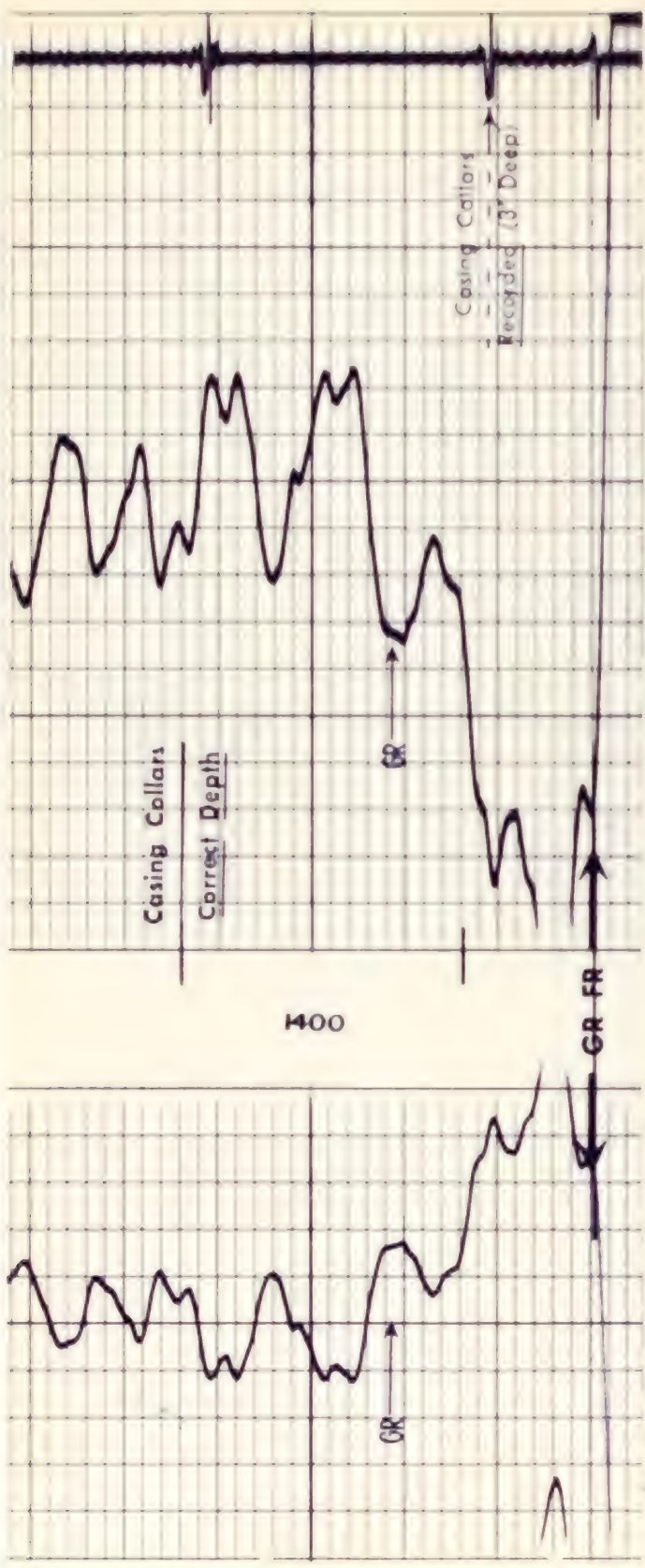
| | | |
|---|---------------|---|
| <p>GAMMA RAY RADIOACTIVITY INCREASES</p> | <p>DEPTHS</p> | <p>GAMMA RAY RADIOACTIVITY INCREASES</p> |
| | | |











| GAMMA RAY RADIOACTIVITY INCREASES | DEPTHS | GAMMA RAY RADIOACTIVITY INCREASES |
|---|--------|---|
| <p>COMPANY ATLANTIC RICHFIELD COMPANY</p> <p>WELL CG-2</p> <p>FIELD</p> | | <p>SCHL FR 1430</p> <p>SCHL TD 1441</p> <p>DRLR TD 1454</p> |

SC 111 FR 1/1/11
SC 111 ID 1/1/11
DR 111 ID 1/1/11

COUNTY RIO BLANCO STATE COLLEGE

RIO BLANCO STATE COLLEGE

PROPERTY OF
FIELD NO.

DATE

TIME

PLACE

COLLECTOR

NO.

DATE

TIME

Schlumberger

CASING COLLAR LOG AND PERFORATING RECORD

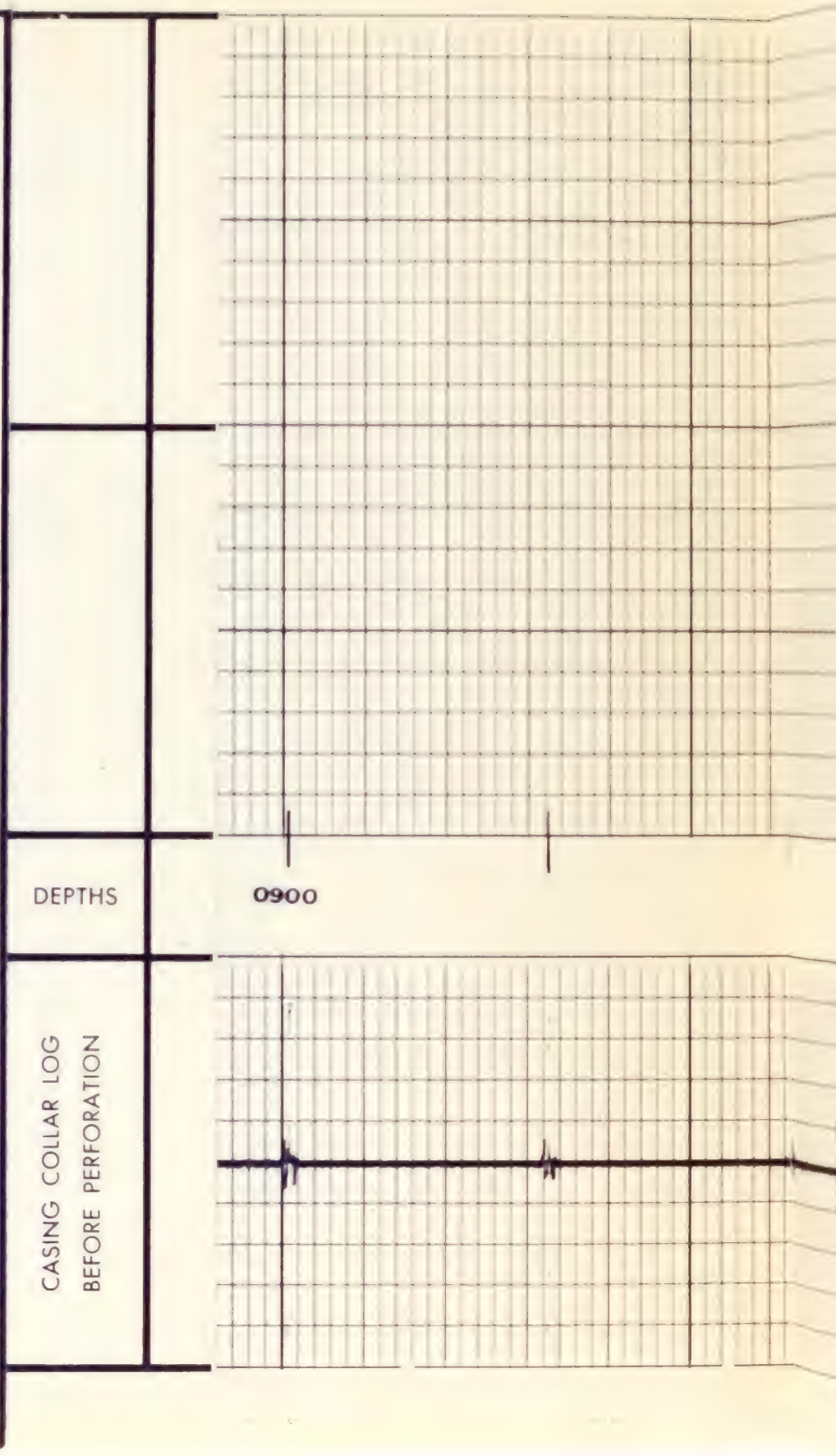
| <div style="writing-mode: vertical-rl; transform: rotate(180deg);">COUNTY <u>RIO BLANCO</u> FIELD or LOCATION WELL <u>CB-NO. 4</u> COMPANY <u>ATLANTIC RICHFIELD</u></div> | COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|-------------|--------------|-------------|-------------------|-------------|-------------|-------------|---------------|--------------|-------------|-------------|-------------------|-------------|--------------|-------------|-----------|--|--|-------------|---------------|--|------------|-------------|-------------|-------------|-------------|--|--|--|--|-------------|-------------|--|--|--|--|
| | WELL <u>CB-NO.4</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | FIELD _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Location: <u>1451' FSL - 960' FWL</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sec. <u>17</u> Twp. <u>3S</u> Rge. <u>96W</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other Services: <u>CBL-VDL-CCL</u> <u>PDC-GR</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Permanent Datum: <u>GROUND LEVEL</u> ; Elev.: <u>7054</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drilling Measured From <u>GL</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Elev.: K.B. _____ D.F. _____ G.L. <u>7054</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date <u>9-24-74</u> Run No. <u>ONE</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PLUG BACK TOTAL DEPTH _____ DRILLER- <u>1469</u> LOGGER- <u>1464</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEPTHS BELOW RELATE TO: OPEN HOLE LOG MEASUREMENTS: <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| : RADIOACTIVITY LOG MEASUREMENTS: <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| : SCHLUMBERGER LINE MEASUREMENTS: <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CASING COLLARS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PERFORATING DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"><thead><tr><th></th><th>No.Shots</th><th>From</th><th>To</th><th>Gun Type</th><th>Gun Size</th></tr></thead><tbody><tr><td><u>1154</u></td><td><u>1311.5</u></td><td><u>136</u></td><td><u>1190</u></td><td><u>1324</u></td><td><u>HYPER DOME</u></td></tr><tr><td><u>1185</u></td><td><u>1342.</u></td><td></td><td></td><td></td><td></td></tr><tr><td><u>1217</u></td><td><u>1373.5</u></td><td></td><td></td><td></td><td></td></tr><tr><td><u>1248</u></td><td><u>1405</u></td><td></td><td></td><td></td><td></td></tr><tr><td><u>1280</u></td><td><u>1435</u></td><td></td><td></td><td></td><td></td></tr></tbody></table> | | | No.Shots | From | To | Gun Type | Gun Size | <u>1154</u> | <u>1311.5</u> | <u>136</u> | <u>1190</u> | <u>1324</u> | <u>HYPER DOME</u> | <u>1185</u> | <u>1342.</u> | | | | | <u>1217</u> | <u>1373.5</u> | | | | | <u>1248</u> | <u>1405</u> | | | | | <u>1280</u> | <u>1435</u> | | | | |
| | No.Shots | From | To | Gun Type | Gun Size | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>1154</u> | <u>1311.5</u> | <u>136</u> | <u>1190</u> | <u>1324</u> | <u>HYPER DOME</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>1185</u> | <u>1342.</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>1217</u> | <u>1373.5</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>1248</u> | <u>1405</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>1280</u> | <u>1435</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BORE HOLE RECORD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CASING RECORD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"><thead><tr><th>Hole Size</th><th>From</th><th>To</th><th>Size</th><th>Type</th><th>Weight</th><th>From</th><th>To</th></tr></thead><tbody><tr><td><u>4 3/4</u></td><td><u>60</u></td><td><u>1502</u></td><td><u>8 5/8</u></td><td></td><td></td><td><u>SURF</u></td><td><u>60</u></td></tr><tr><td></td><td></td><td></td><td><u>2 5/8</u></td><td></td><td><u>4.7</u></td><td><u>SURF</u></td><td><u>1469</u></td></tr></tbody></table> | | Hole Size | From | To | Size | Type | Weight | From | To | <u>4 3/4</u> | <u>60</u> | <u>1502</u> | <u>8 5/8</u> | | | <u>SURF</u> | <u>60</u> | | | | <u>2 5/8</u> | | <u>4.7</u> | <u>SURF</u> | <u>1469</u> | | | | | | | | | | | | |
| Hole Size | From | To | Size | Type | Weight | From | To | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>4 3/4</u> | <u>60</u> | <u>1502</u> | <u>8 5/8</u> | | | <u>SURF</u> | <u>60</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | <u>2 5/8</u> | | <u>4.7</u> | <u>SURF</u> | <u>1469</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HOLE FLUID DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opr. Rig Time: <u>19 HOURS</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type Fluid: <u>WATER</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Truck No. <u>3862</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Density: _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location: <u>VERNAL</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fluid Level: <u>FULL</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Recorded By: <u>ST. AUBYN</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Witnessed By: <u>MR. ELLARD</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

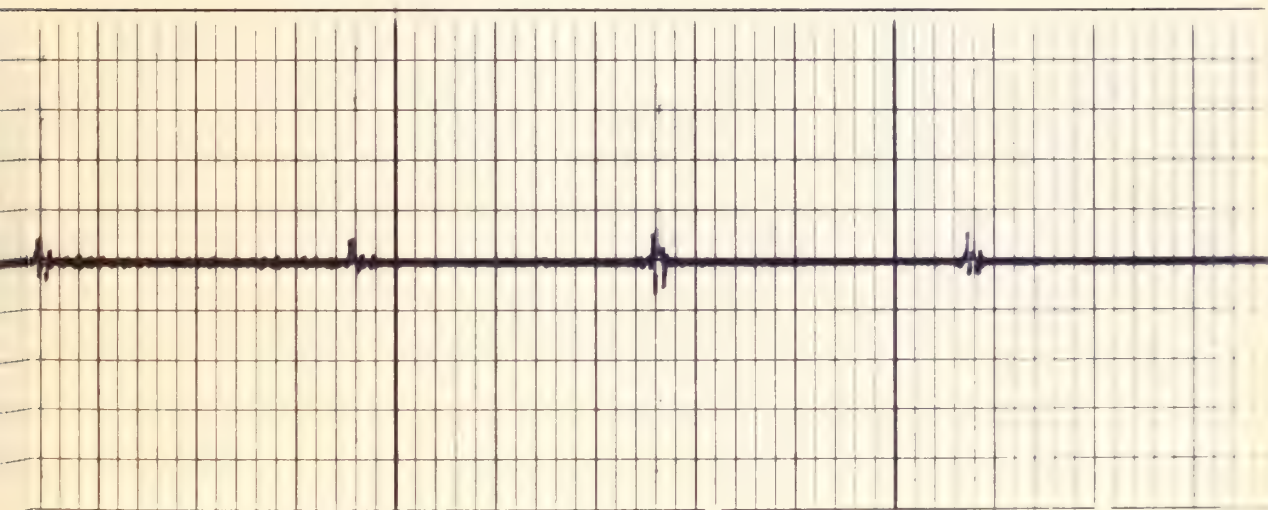
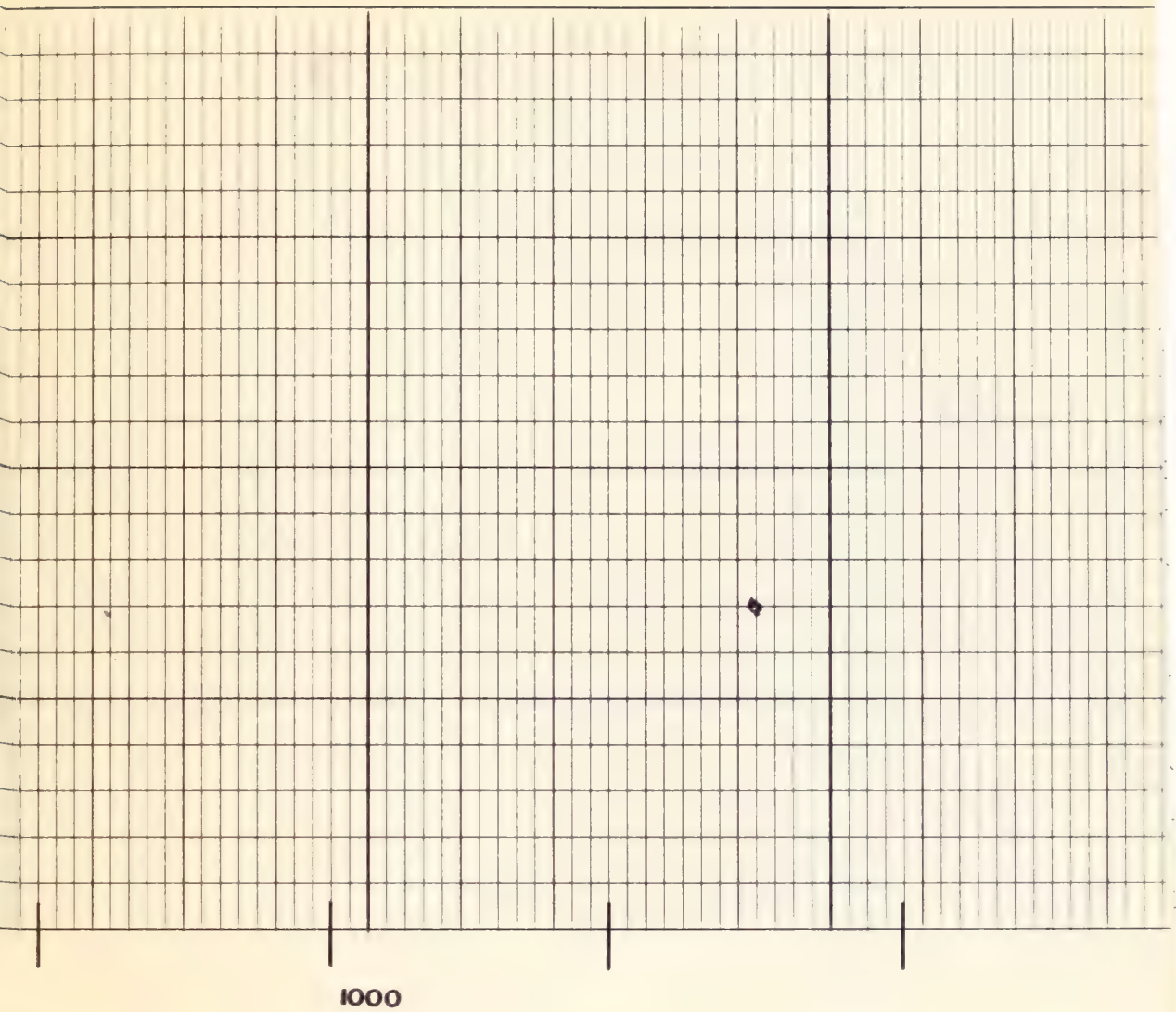
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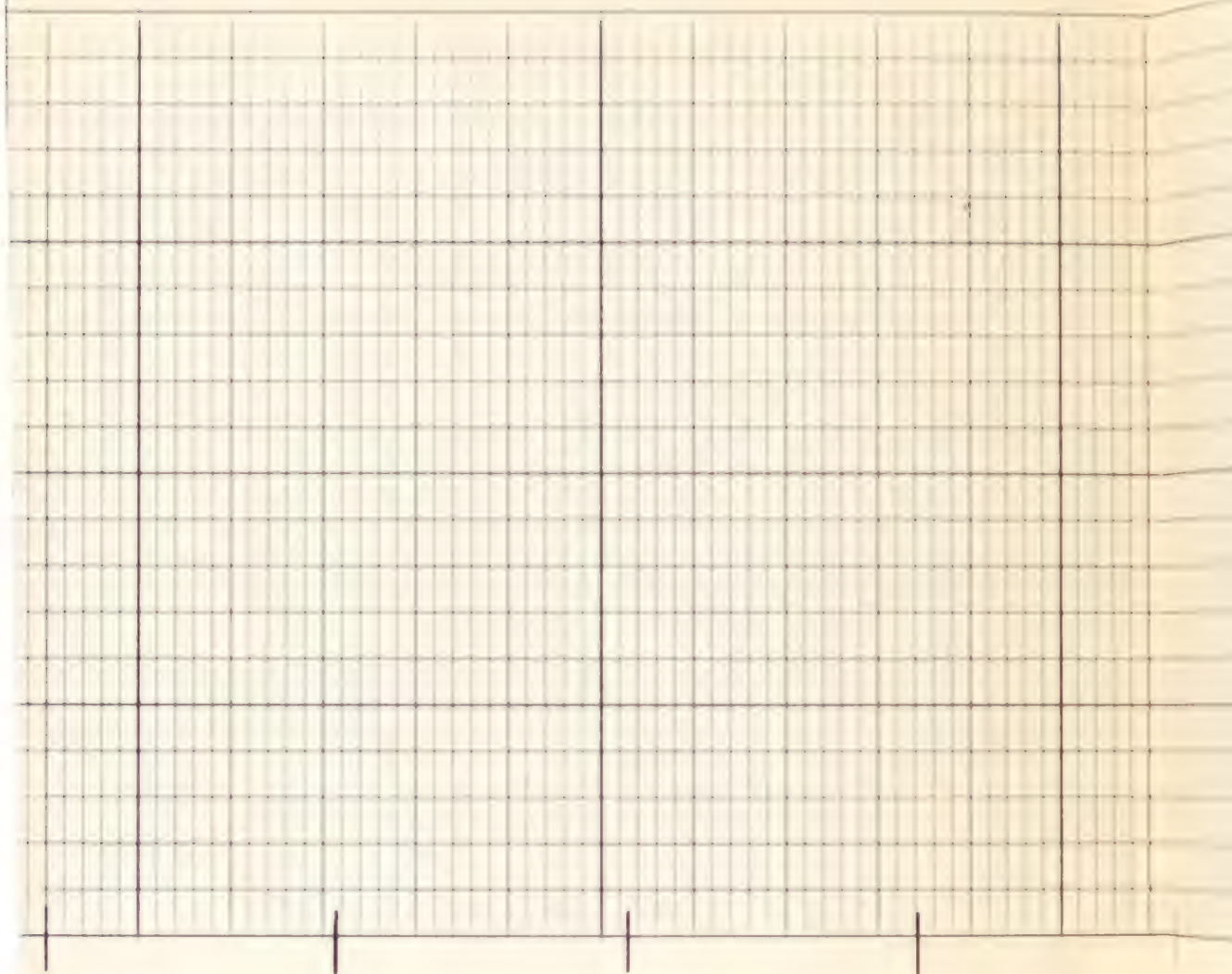
The well name, location and borehole reference data were furnished by _____

REMARKS _____

API Serial No. 1A
Service Order No. 49329

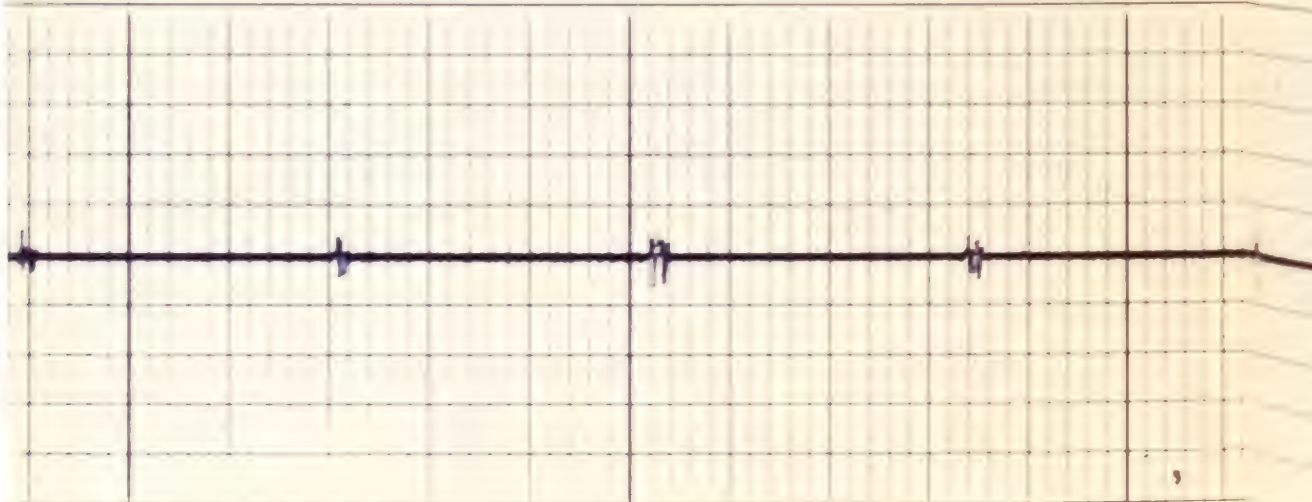


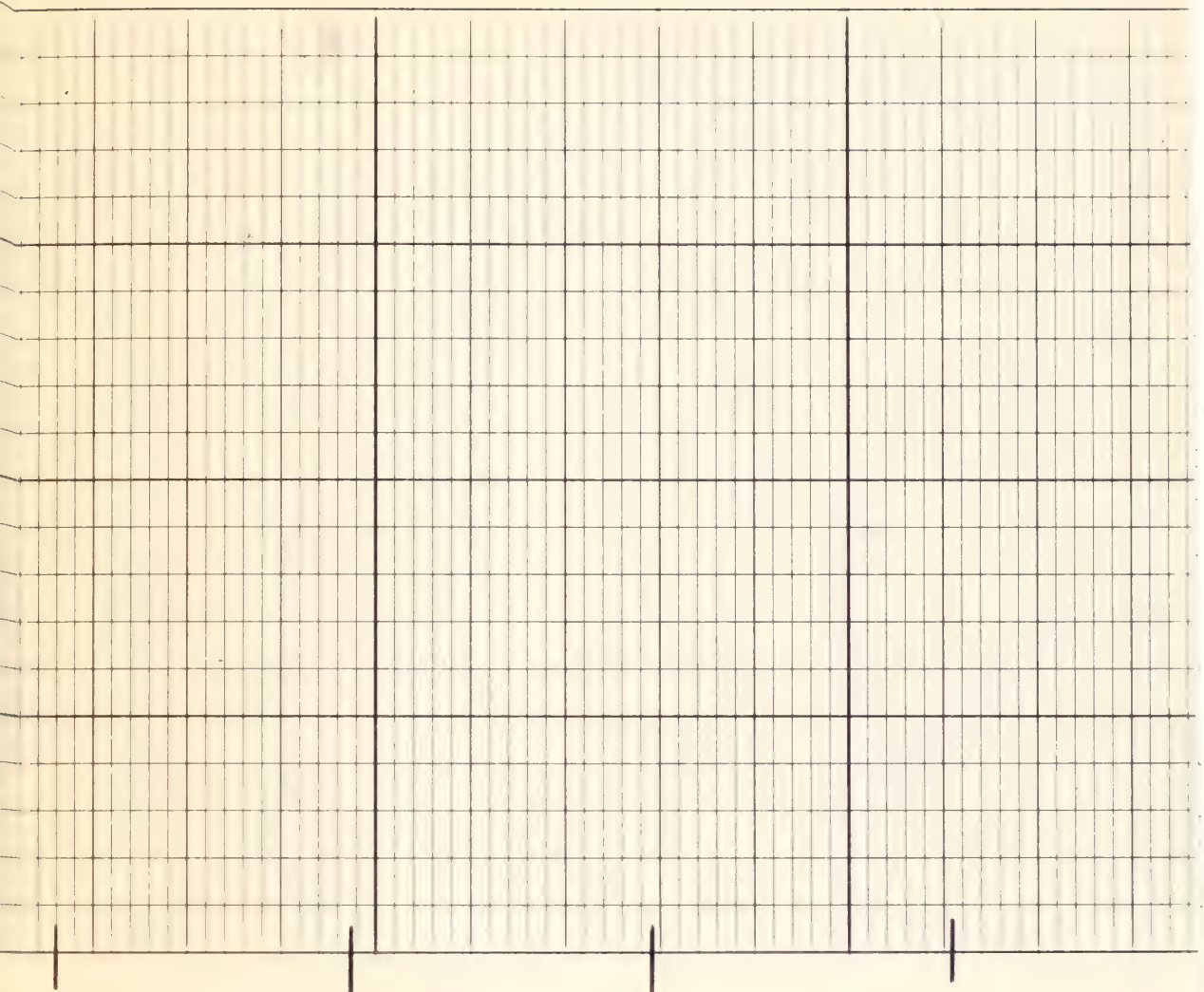




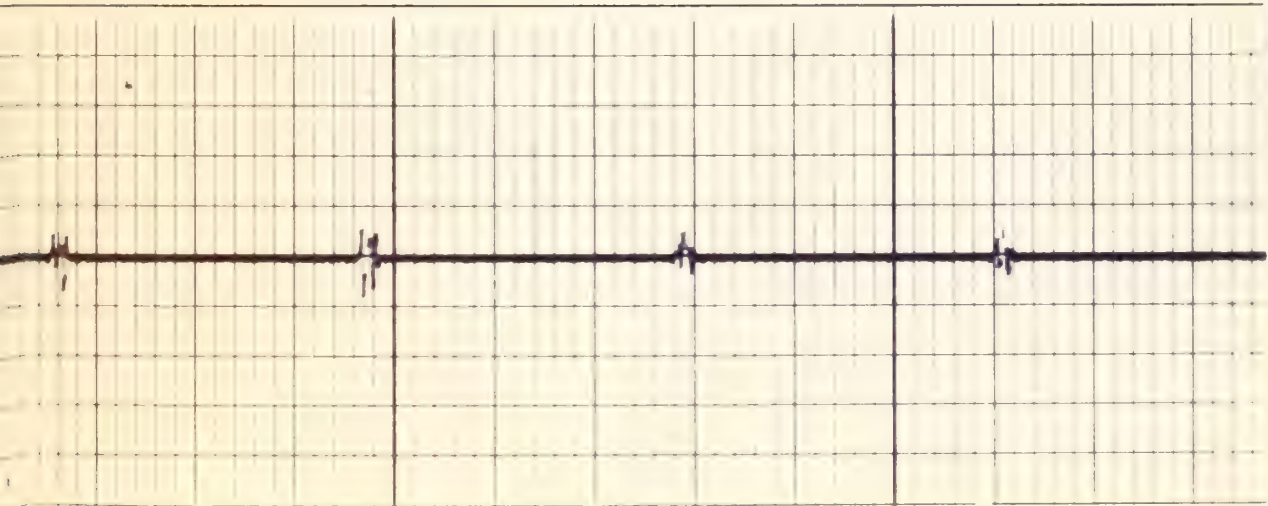
1100

1200

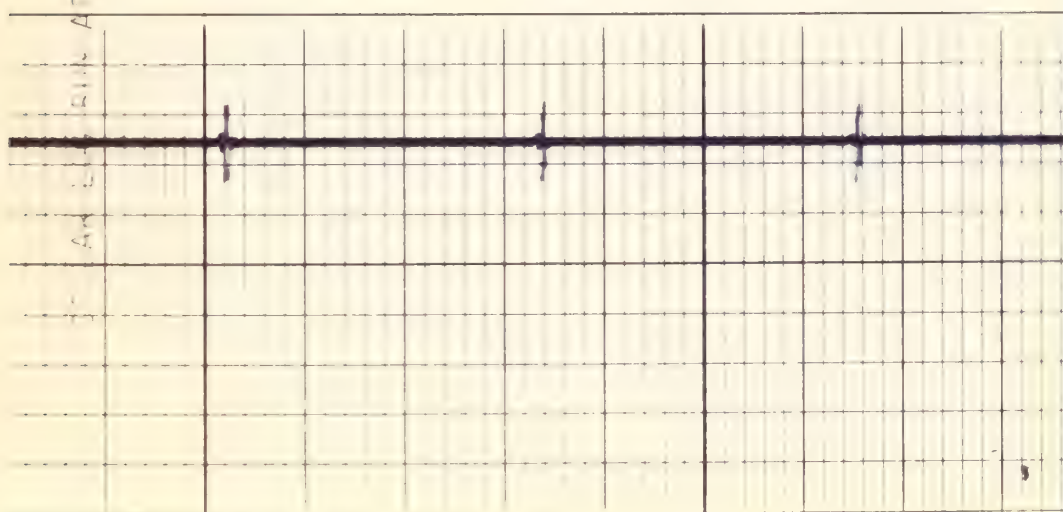
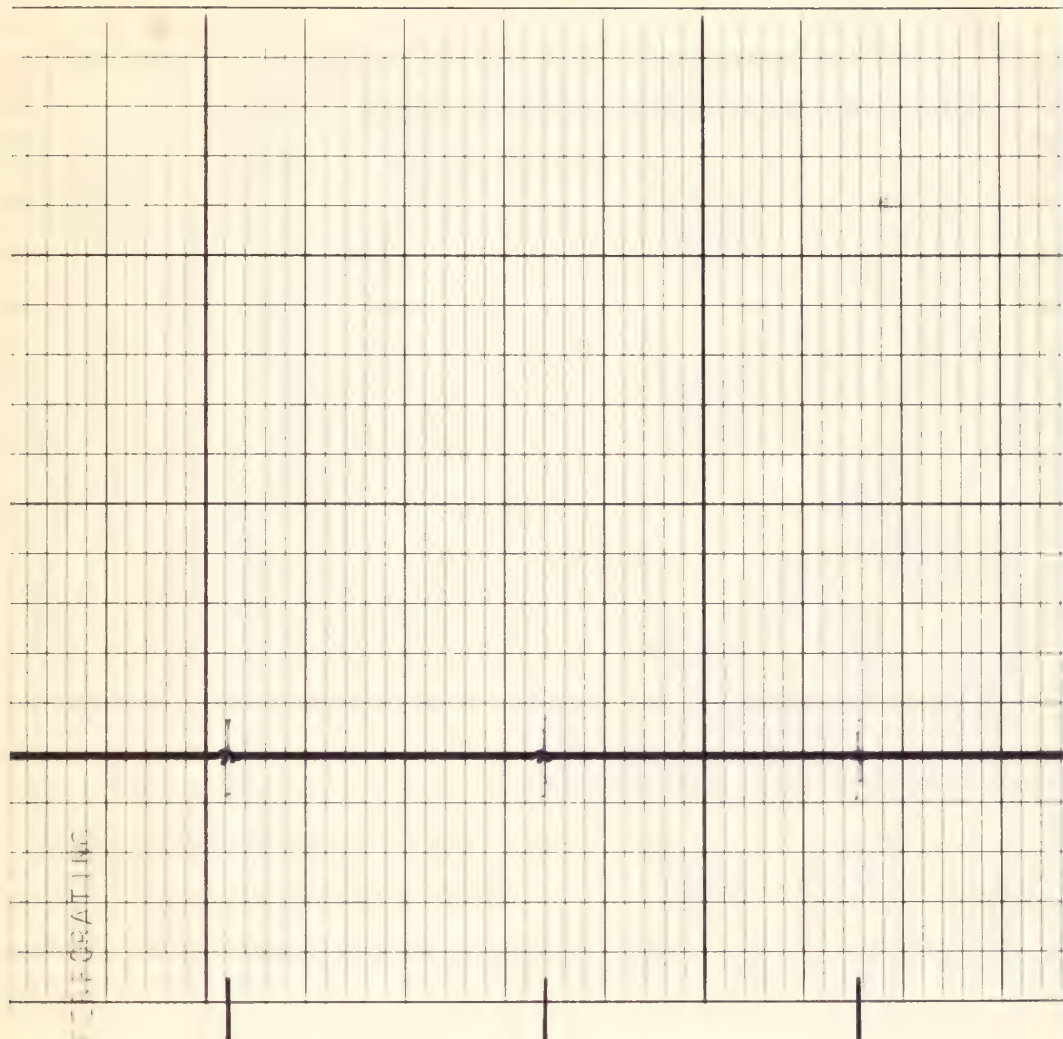




1300

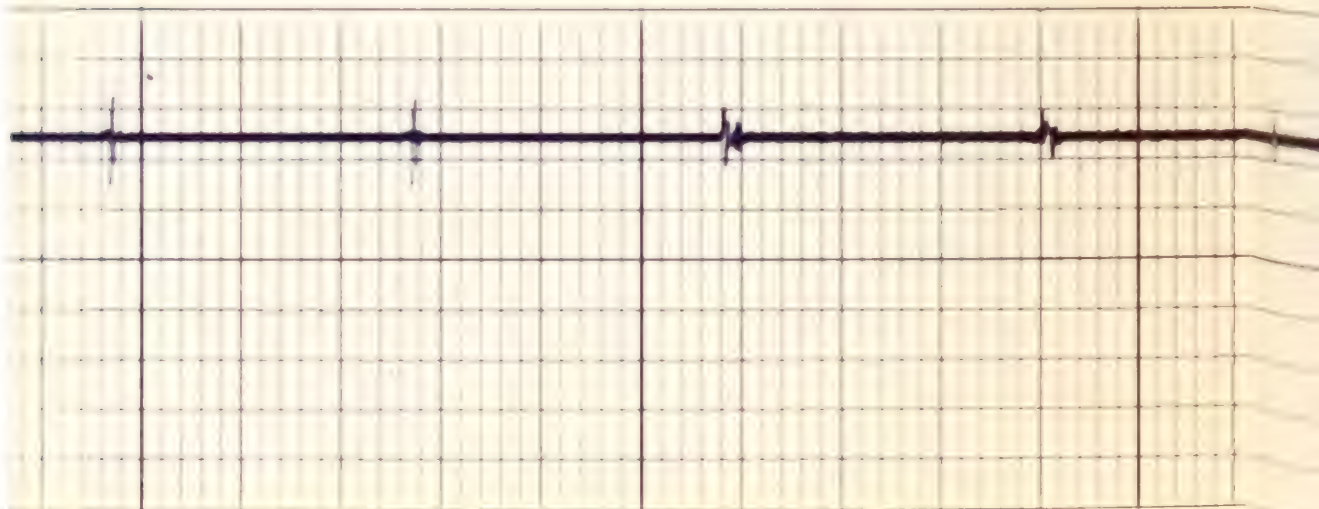
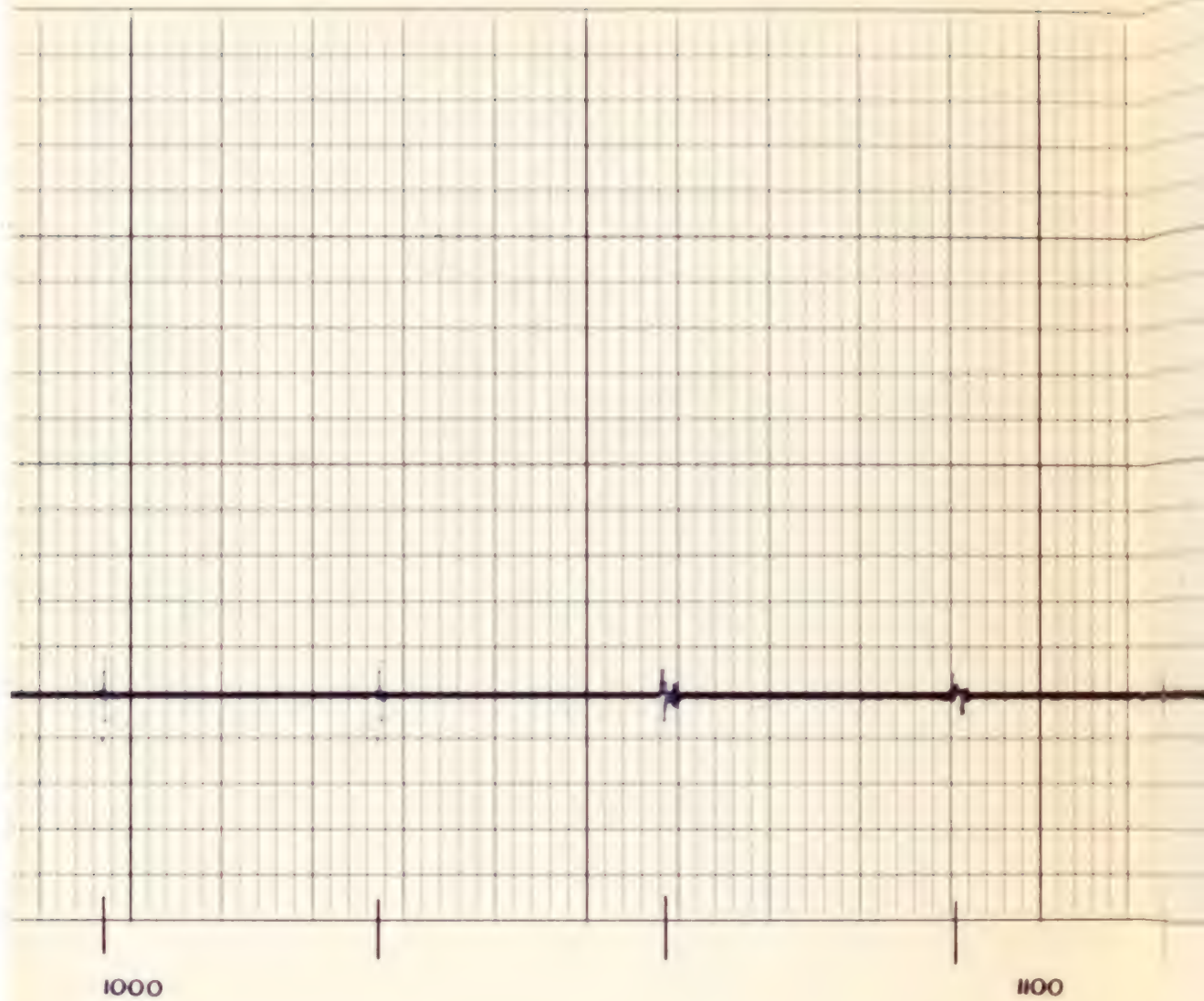


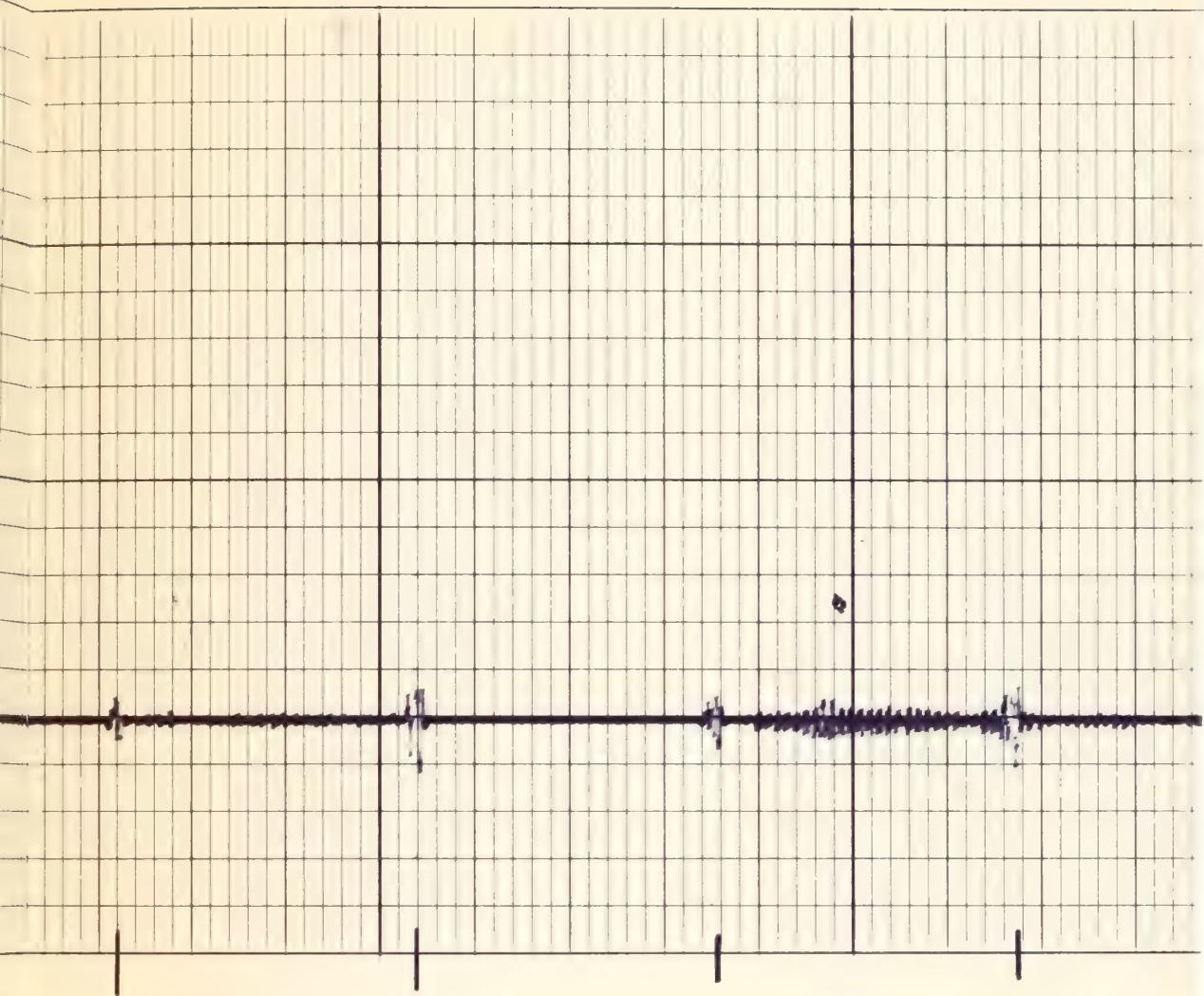
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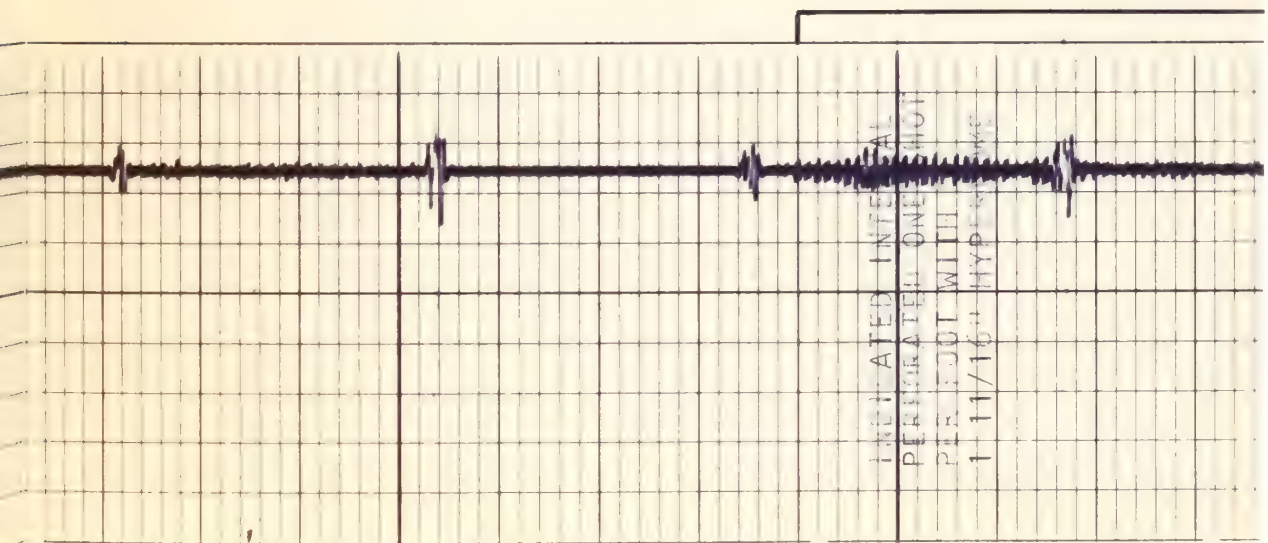
AM LUNAR AFTER PERCENTAGE

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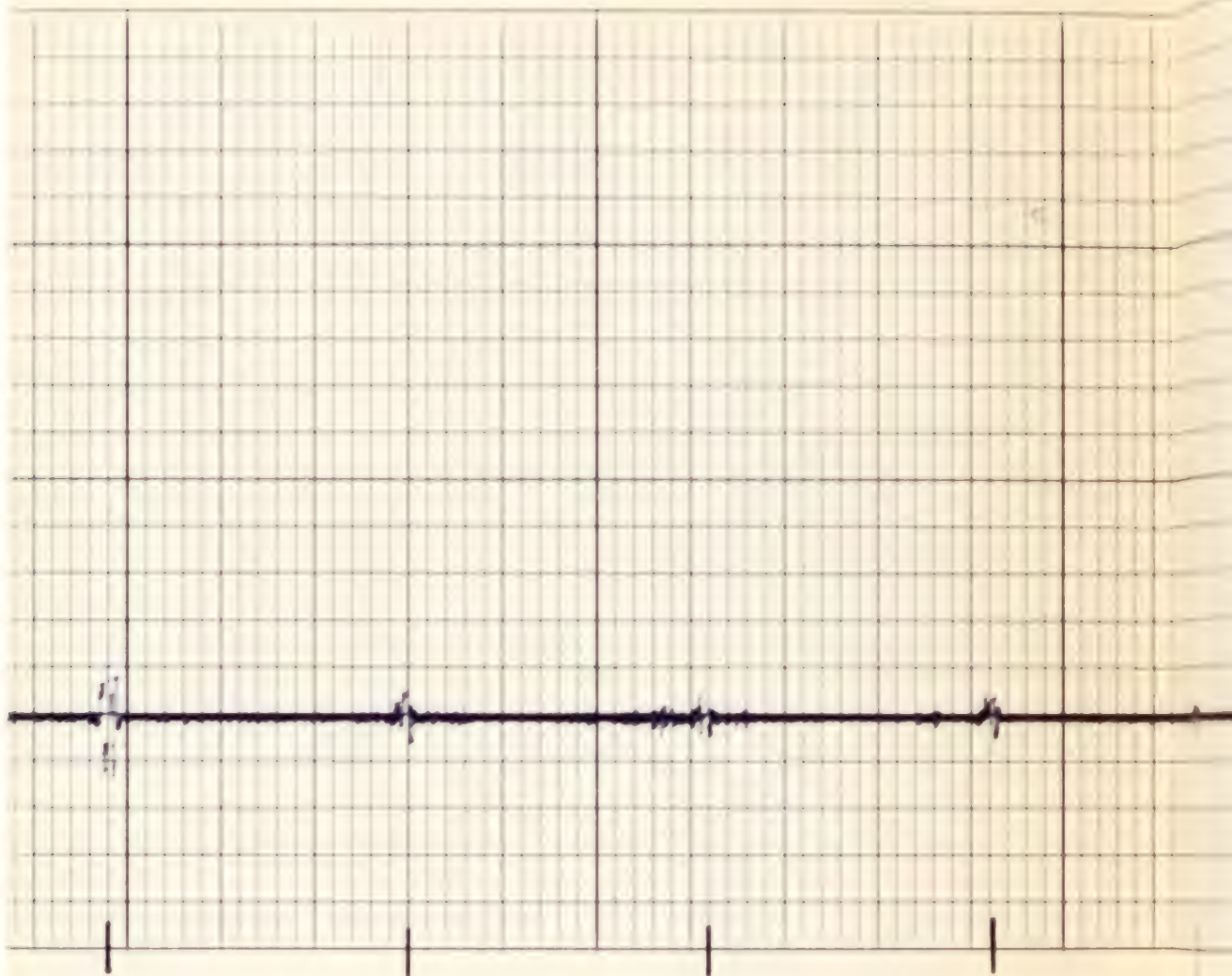




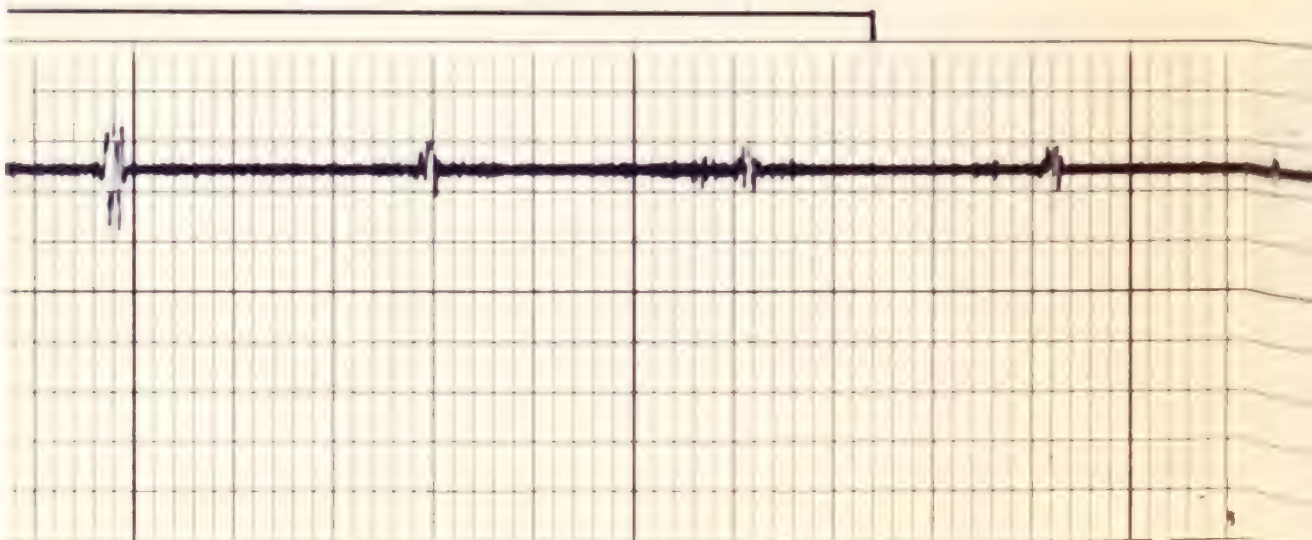
1200



INTEGRATED INTEGRAL
PERICARDIAL ONE SHOT
PER FOOT WITH
1-11/16" HYPERCUT



1300





| CASING COLLAR LOG AFTER PERFORATION | | DEPTHS | |
|--|--|--------|--|
| | | | |

ORLR TD 1459

Elev:

DF

16

GL 750

GL 750

1

1

Schlumberger

CEMENT BOND LOG

GR-CCL-VDL

| | | | | | | | |
|---|--|---|--|--|--|--|--|
| COUNTY Field or LOCATION WELL COMPANY | RIO BLANCO | COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | | | | | |
| | CB NO. 4 | WELL <u>CB-NO. 4</u> | | | | | |
| | ATLANTIC RICHFIELD COMPANY | FIELD _____ | | | | | |
| | COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> | | | | | | |
| LOCATION <u>1451'</u> API Serial No. <u>FSL- 960'</u> FWL | | Other Services: <u>SP-HD</u> | | | | | |
| Sec. <u>17</u> Twp. <u>3S</u> Rge. <u>96W</u> | | | | | | | |

| | | | |
|--|--|-------------------------|--|
| Permanent Datum: <u>GROUND LEVEL</u> , Elev. <u>7054</u> | | Elev.: K.B. <u>----</u> | |
| Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum | | D.F. <u>----</u> | |
| Drilling Measured From <u>GL</u> | | G.I. <u>7054</u> | |

| | | | |
|-------------------|---------|------------------|-------------|
| Date | 9-24-74 | Type Drill Fluid | WATER |
| Run No. | ONE | Fluid Level | FULL |
| Depth — Driller | 1469 | Max. Rec. Temp. | ---- °F |
| Depth — Logger | 1464 | Est. Cement Top | 1210 |
| Btm. Log Interval | 1456 | Equip. Location | 3862 VERNAL |
| Top Log Interval | 1100 | Recorded By | ST. AUDYN |
| Open Hole Size | 4 3/4 | Witnessed By | MR. ELLARD |

| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom |
|----------------|-------|-------|-------|------------|-----|--------|
| Surface String | 8 5/8 | | | T & C | 0 | 60 |
| Prot. String | | | | | | |
| Prod. String | 2 3/8 | 4.7 | | T & C | 0 | 1469 |
| Liner | | | | | | |

| PRIMARY CEMENTING DATA | | | | |
|------------------------|---------|------------|------------|-------|
| STRING | Surface | Protection | Production | Liner |
| Vol. of cement | | | 50 SKS | |
| Type of cement | | | CLASS "G" | |
| Additive | | | 3% CAL-CHI | |
| Retarder | | | | |
| Wt. of slurry | | | | |
| Water loss | | | | |
| Type fluid in csg. | | | | |
| Fluid wt. | | | | |

FOLD HERE The well name, location and borehole reference data were furnished by the customer

| PRIMARY CEMENTING PROCEDURE | | | REMARKS | |
|-----------------------------|---------------|--|-------------------|-----------------------|
| | Hour - date | Hours from start of operation | Service Order No. | Csg. Collars Recorded |
| Started pumping cement | 16:00 9-14-74 | | 43319 | 13 ft. 33 ft. |
| Release pressure | 11:00 9-24-74 | | | |
| Start Cement Bond Log | 14:00 9-24-74 | | | |
| Finish Cement Bond Log | | | | |
| Preceding fluid | Volume bbls. | Pipe reciprocated during Pumping: Yes | No | |
| Cement pumped | bbls./minute | Pipe reciprocated after plug down: Yes | min., No | |
| SQUEEZE JOB DETAIL | | | | |
| Squeeze number | 1 | 2 | Equipment Data | Centralizer Depths |
| Date | | | Sonic Panel No. | SLP-FH0029 |
| Depth interval | | | Sonic Cart No. | SHH-AH0015 |
| Type cement | | | Sonic Sonde No. | SLT-JC051 |
| Volume of cement | | | CRP No. | 14 |
| Additive | | | Mem Panel No. | MMP-BB001 |
| Retarder | | | GR Panel No. | GNP-DB055 |
| Weight of slurry | | | GR Cart No. | SHH-AH0021 |
| Preceding fluid | | | Centralizer: Type | CHE-V CBL-4J |
| Breakdown pressure | | | No. | CHEW |
| Max. pressure-stage 1 | | | To Level (MV) | 100 |
| " " 2 | | | Cart. Gain | 1730 |
| " " 3 | | | CRP Intensity | .16 |
| Final maximum pressure | | | R9G Intensity | 7.2 |
| Started pumping cement | | | Logging Speed | 30 fpm |
| Released pressure | | | Time Constant | |
| Start CBL | | | | |
| Finish CBL | | | | |
| AVERAGE WELL DRIFT: | from | to | from | to |

VARIOUS SURVEYS

CABLE LOGS

TRANSIT TIME

CLAMMA RAY

TRANSIT TIME

MICROSECONDS _____ SPACING _____
400 _____ 200 _____

GAMMA RAY API UNITS

DEPTH

CASING BOND

MILLIVOLTS

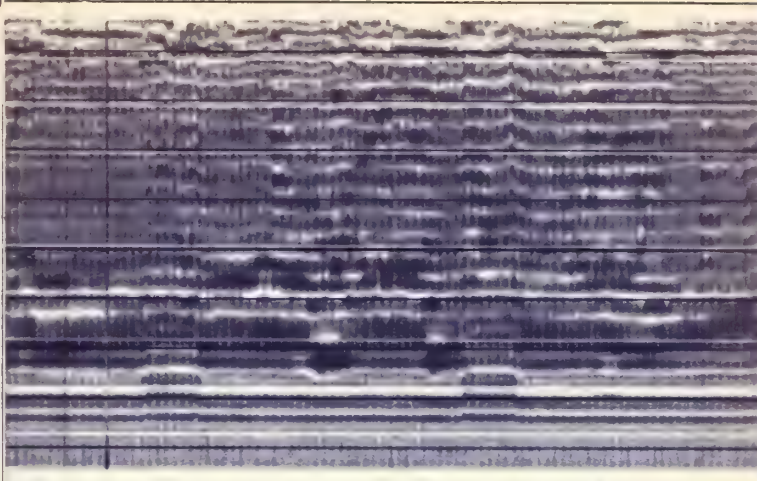
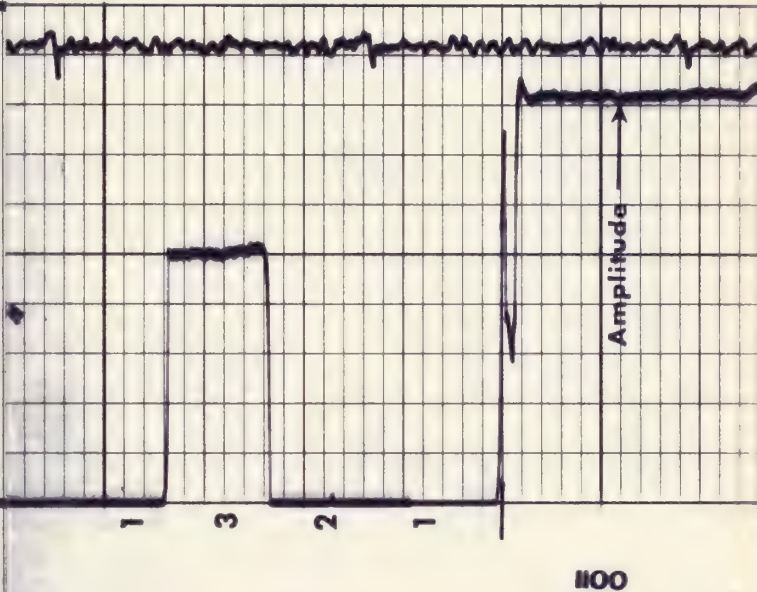
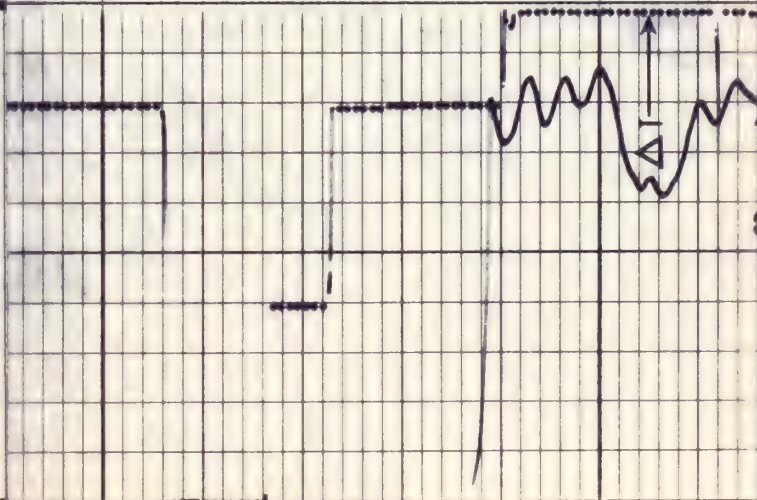
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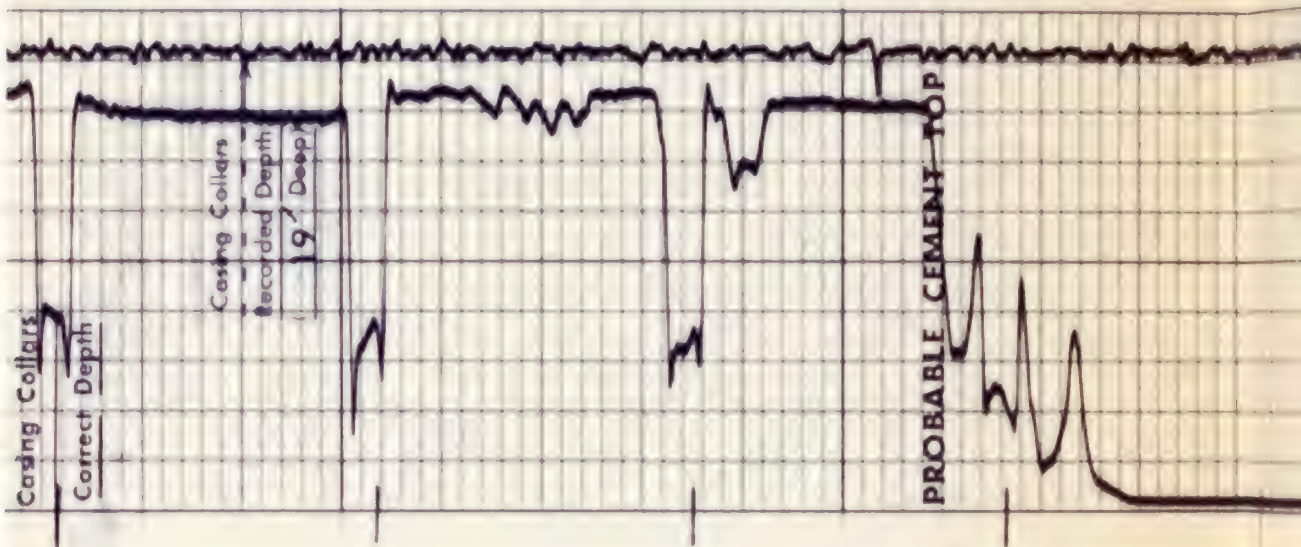
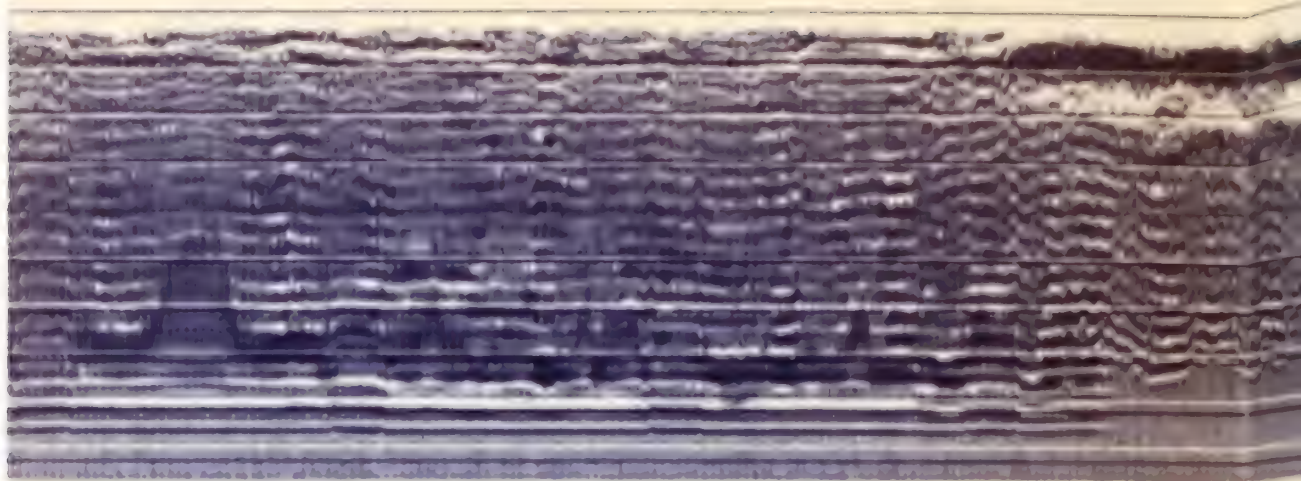
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MICROSECONDS _____ SPACING _____
200 _____ 1200 _____

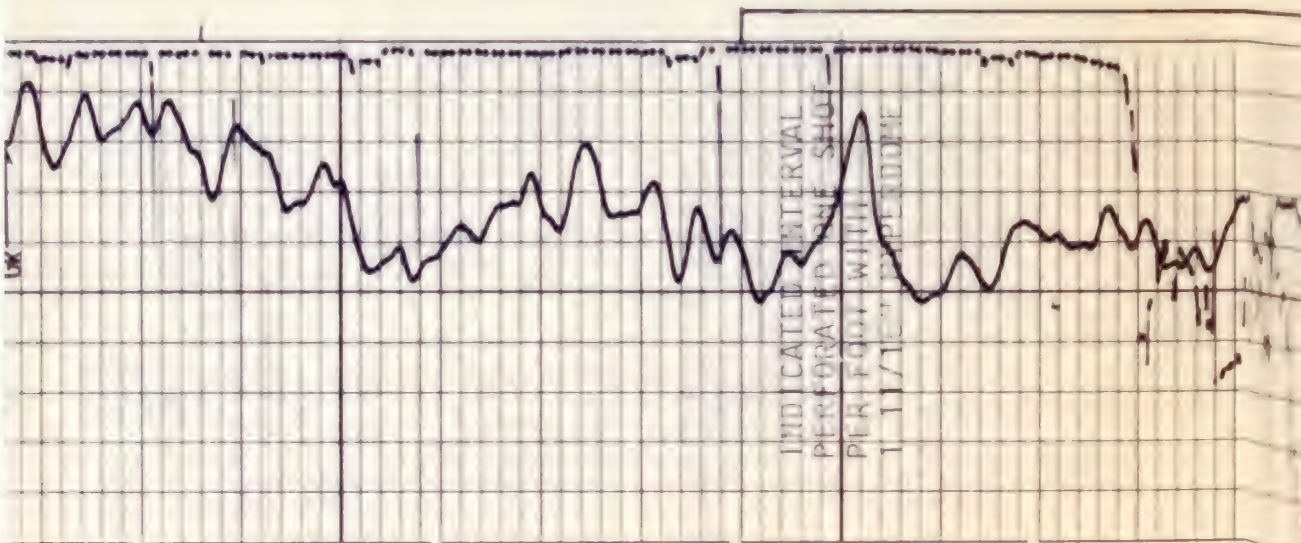
Casing Collars
Corrected Depth

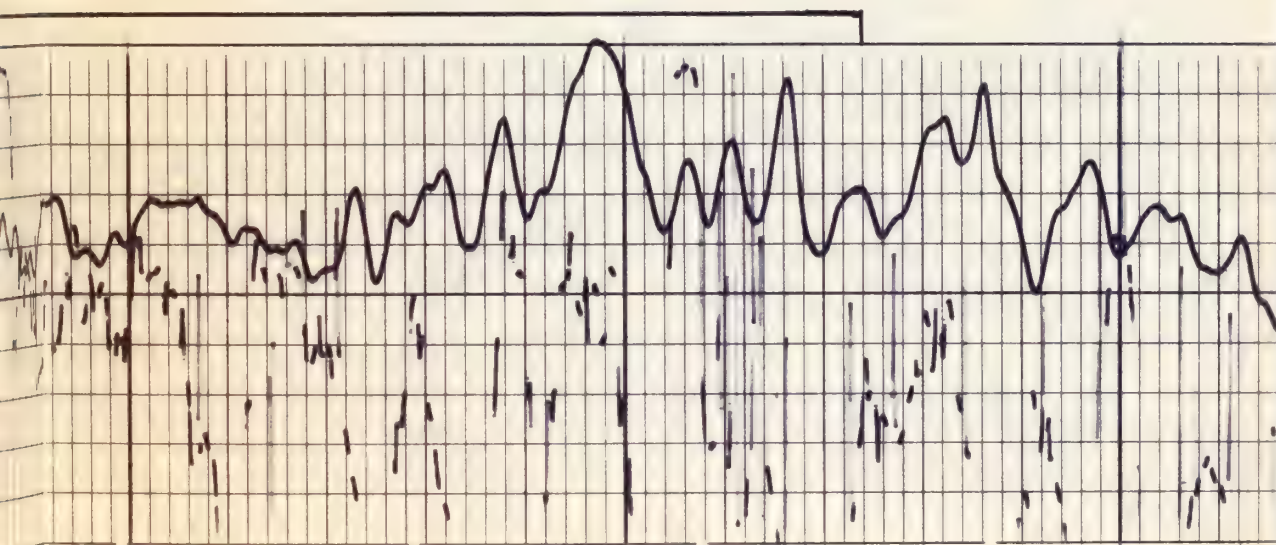
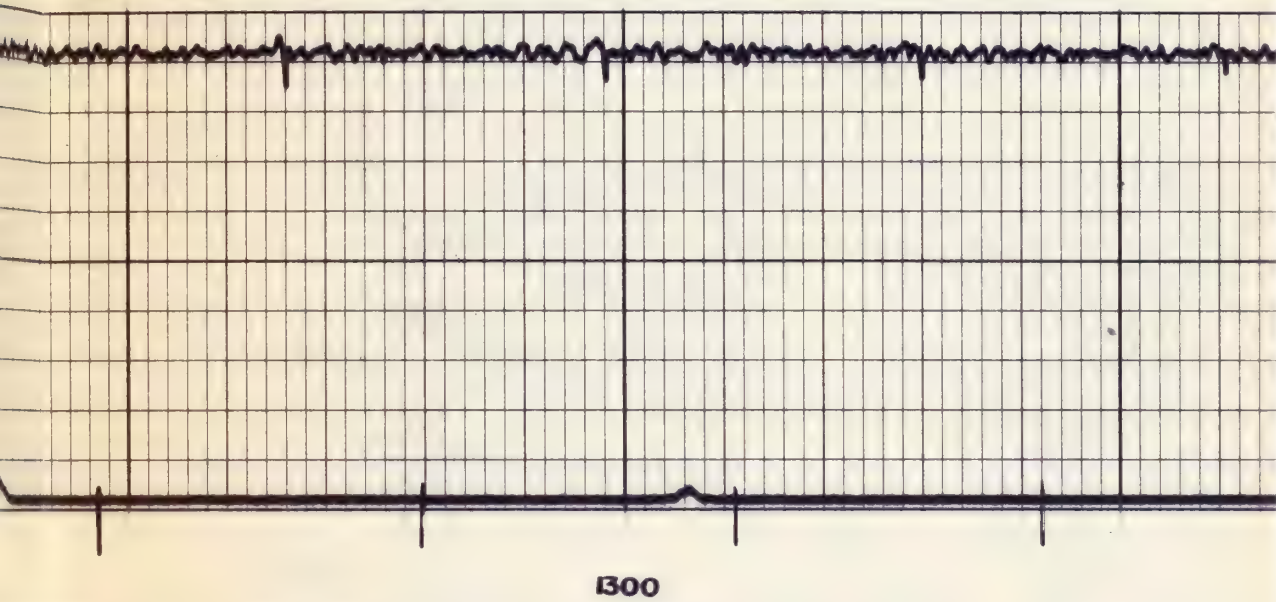
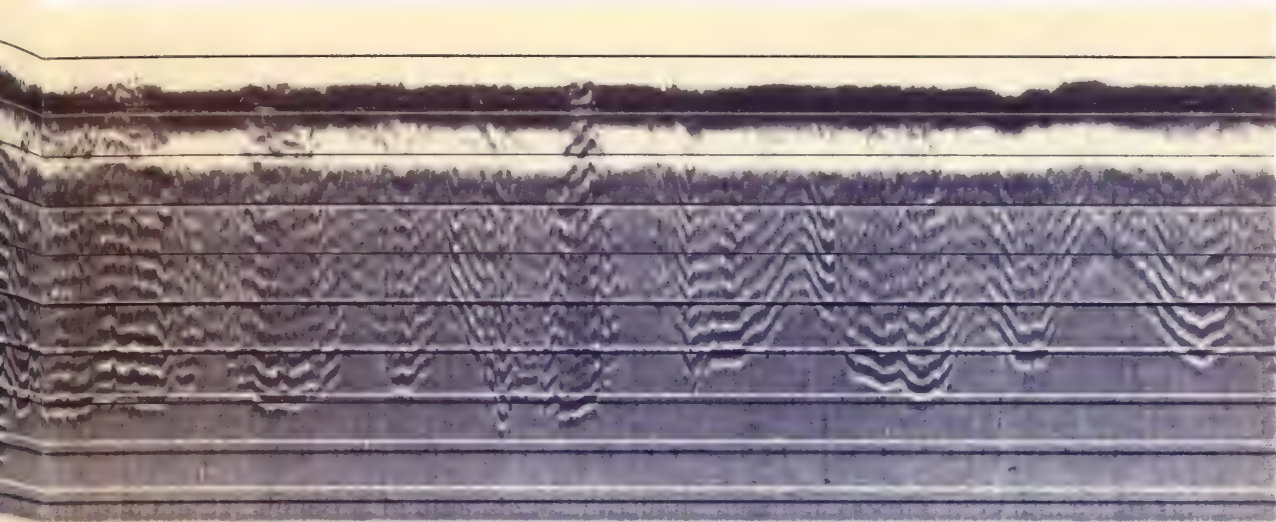
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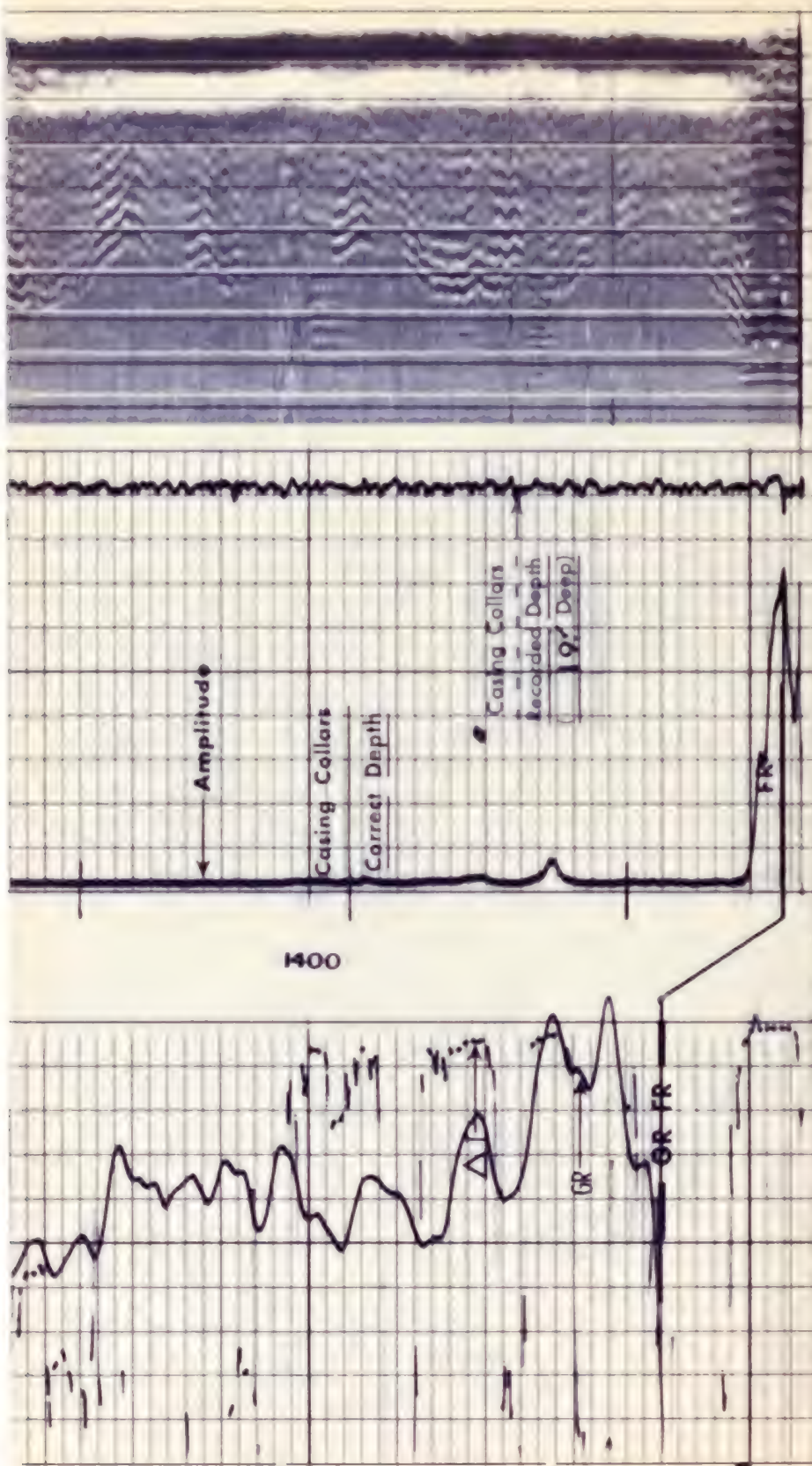




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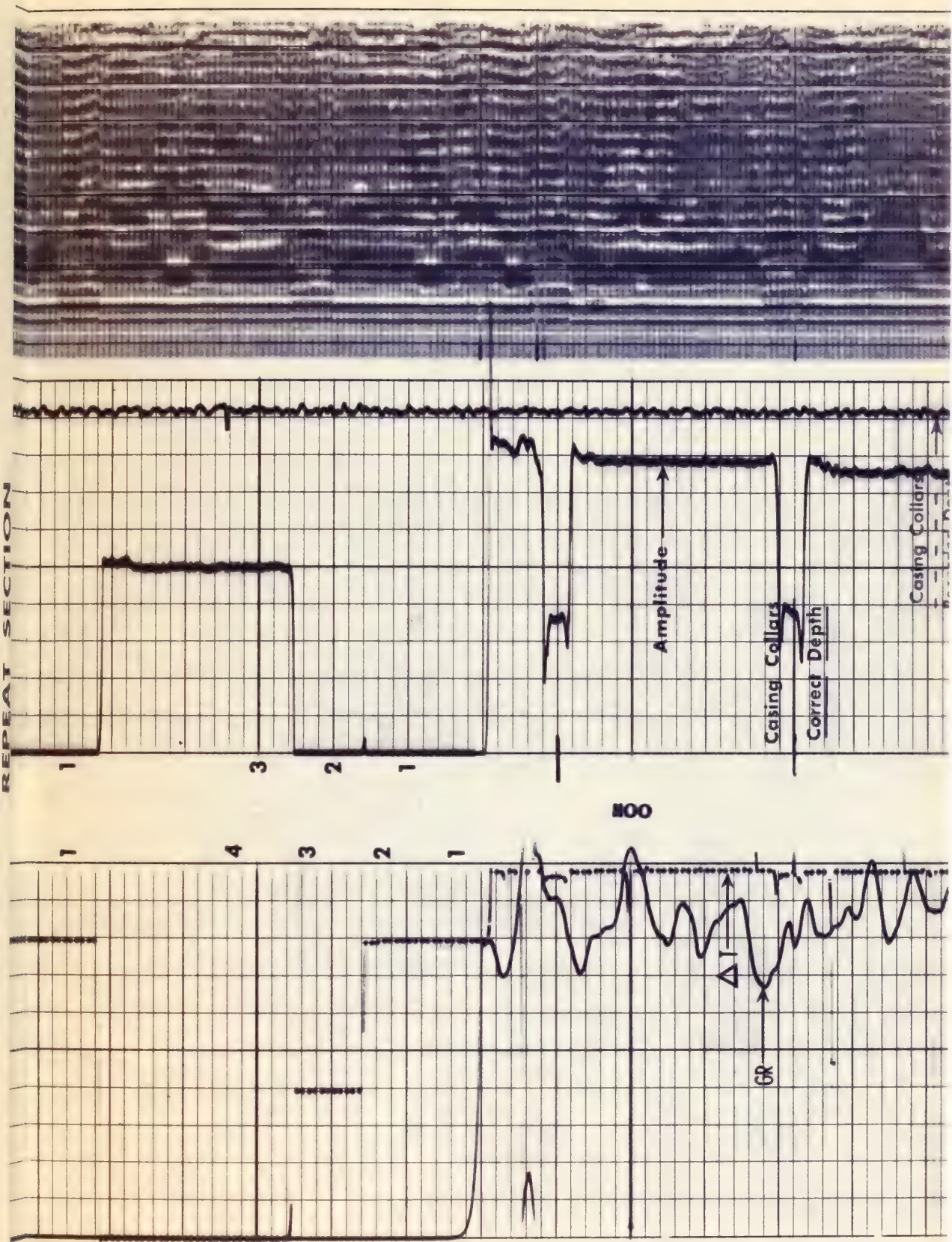


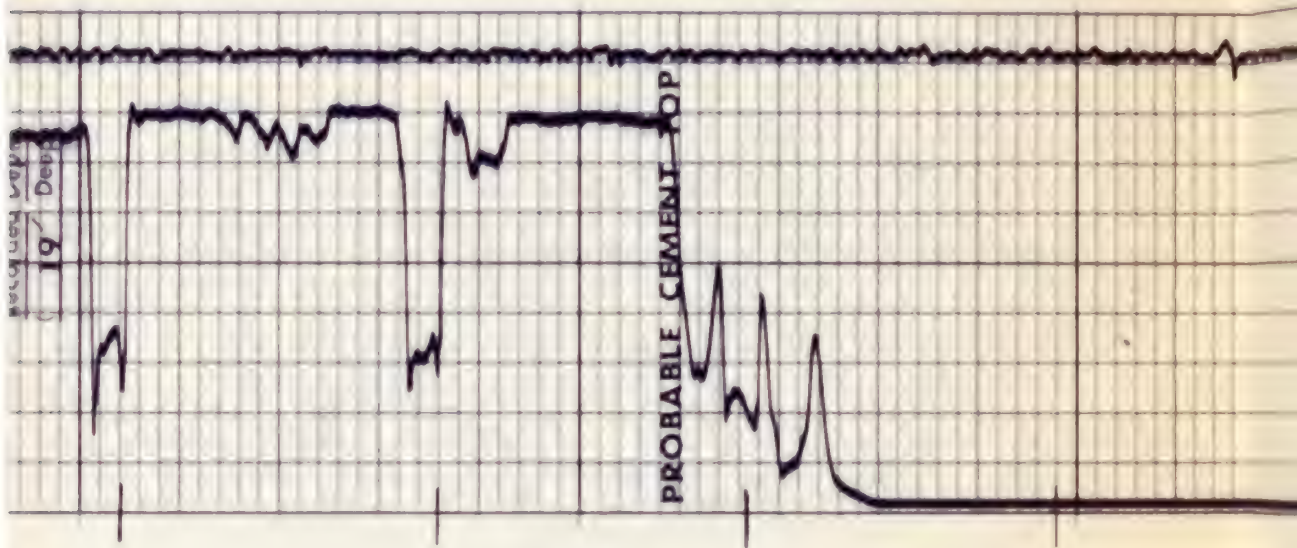
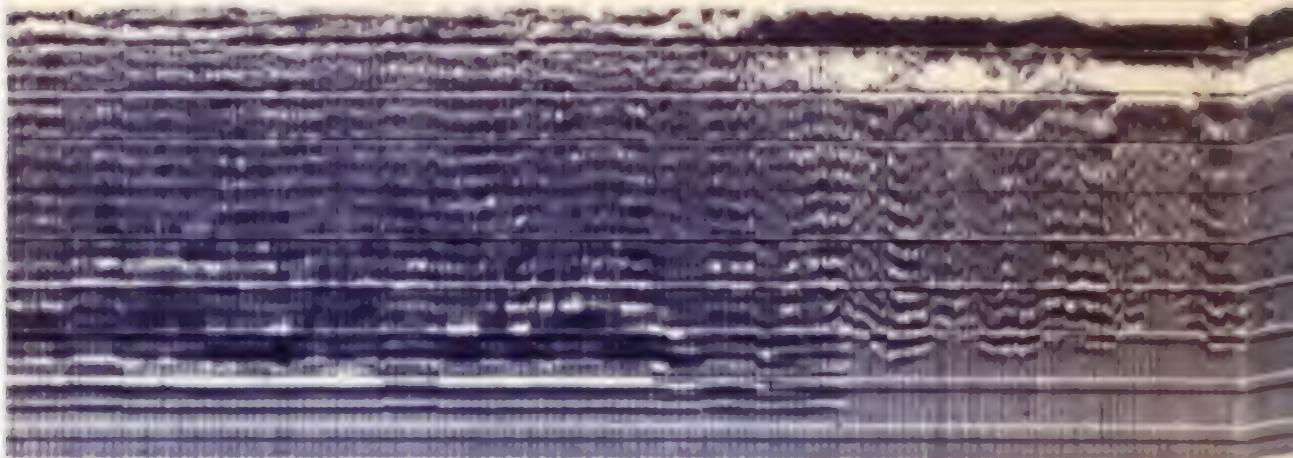




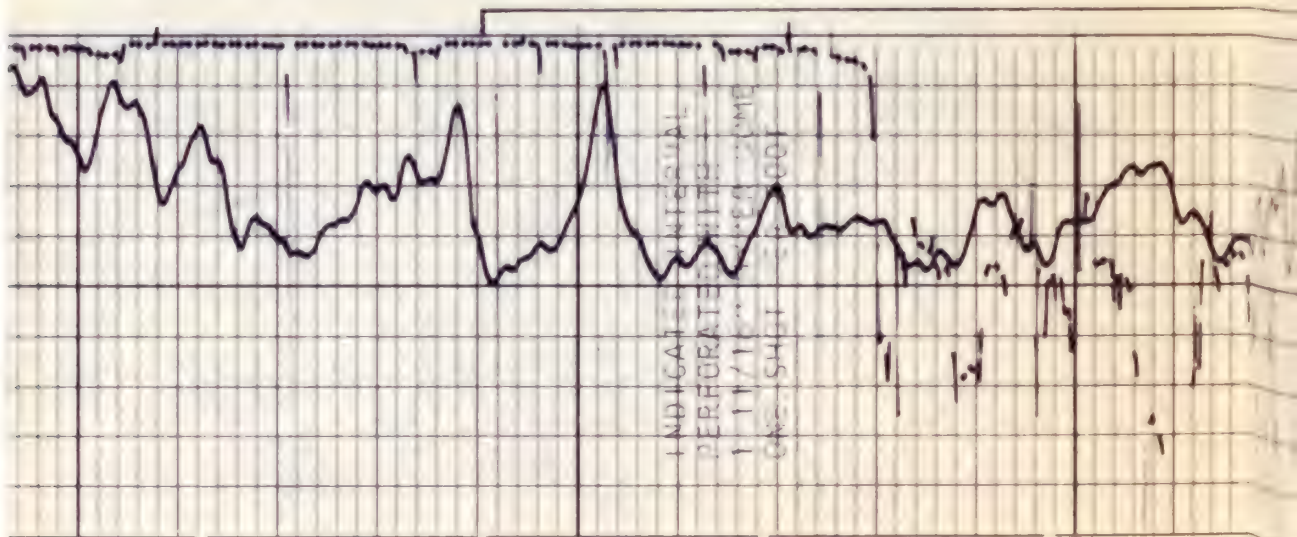
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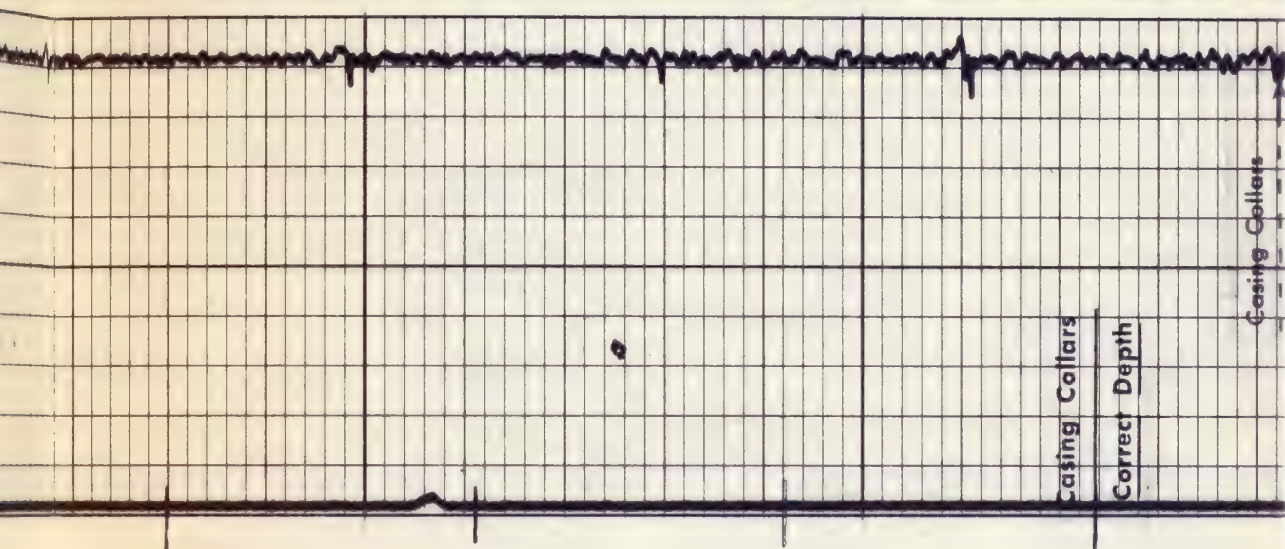
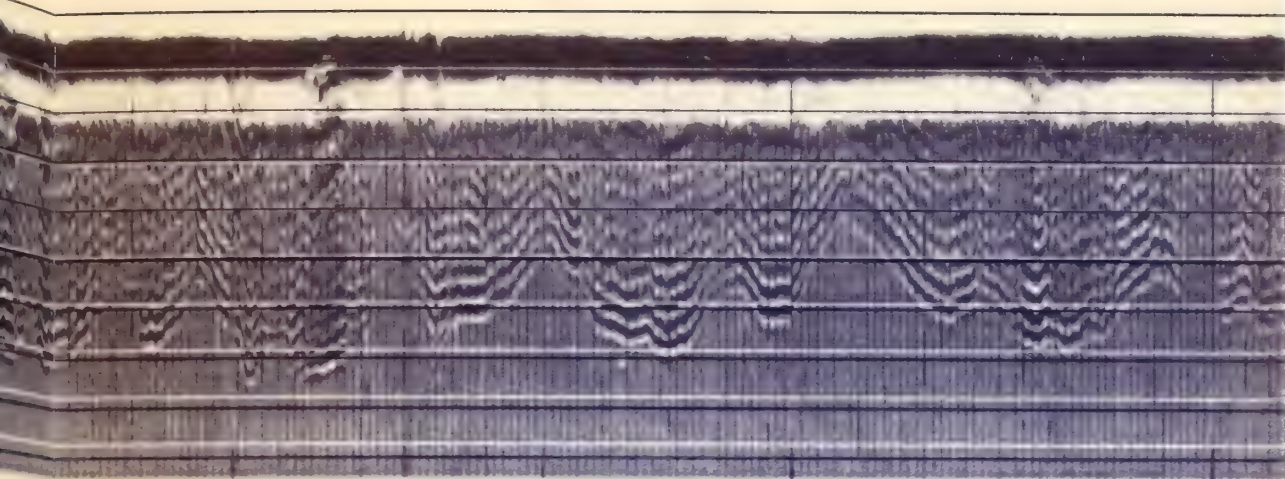
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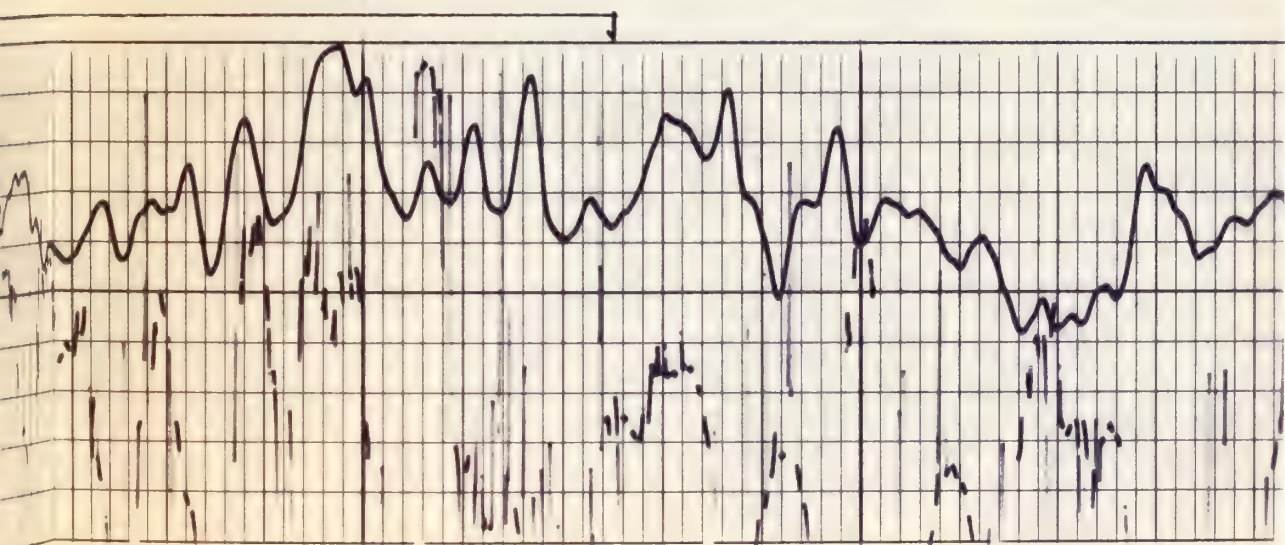


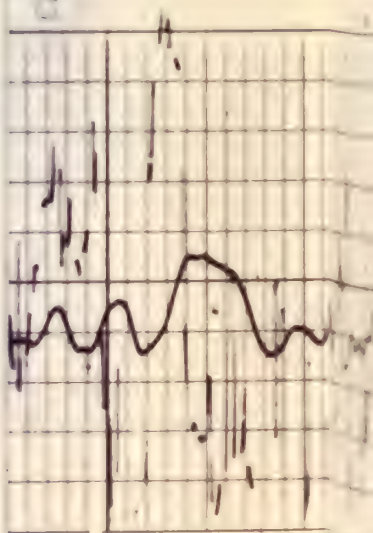
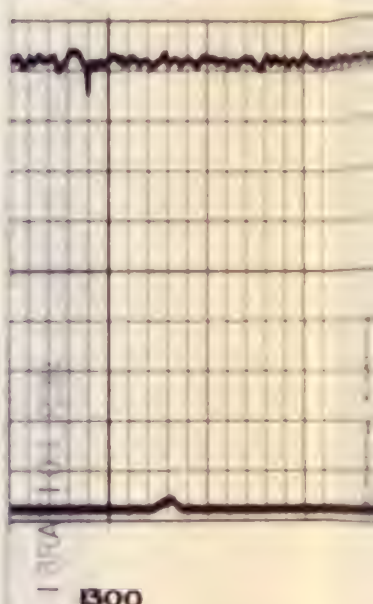
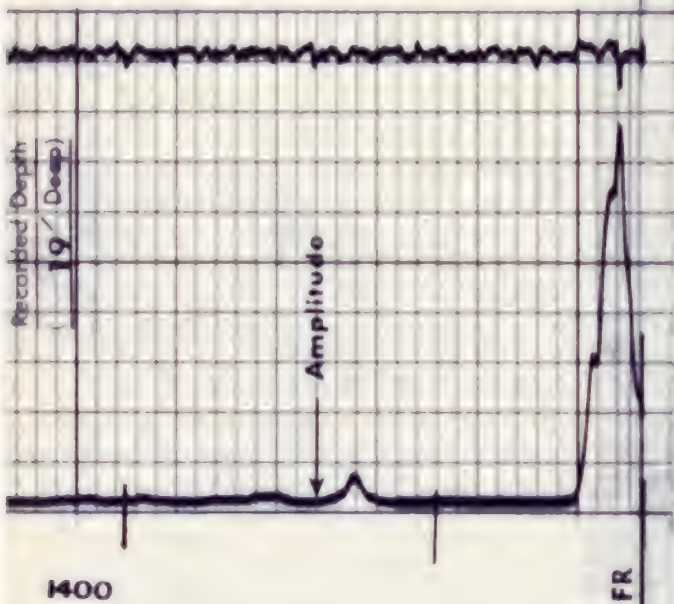
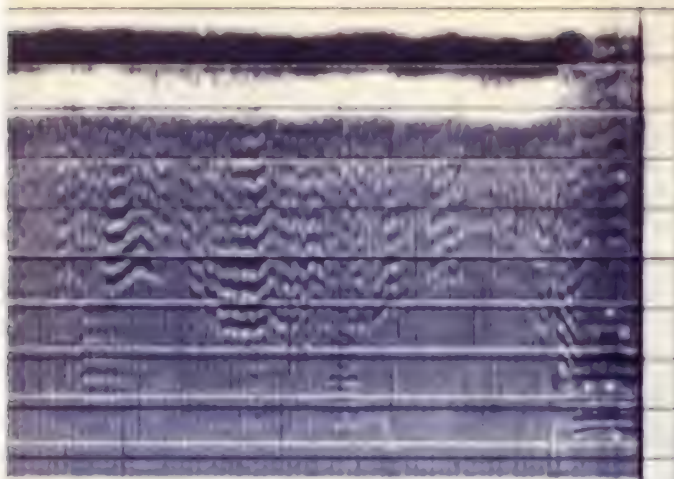
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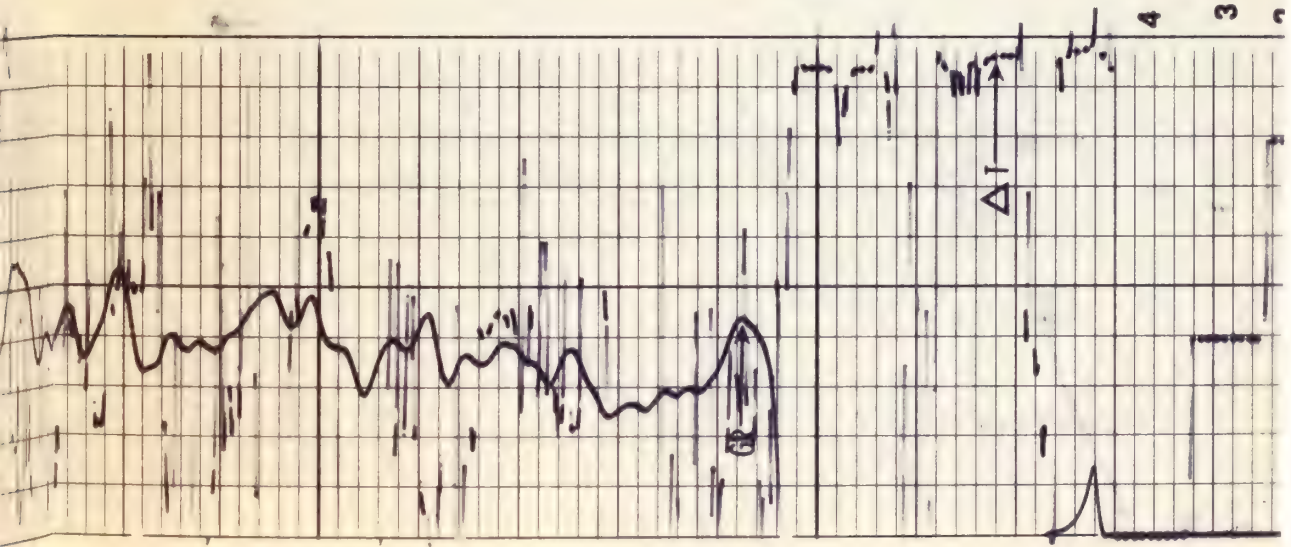
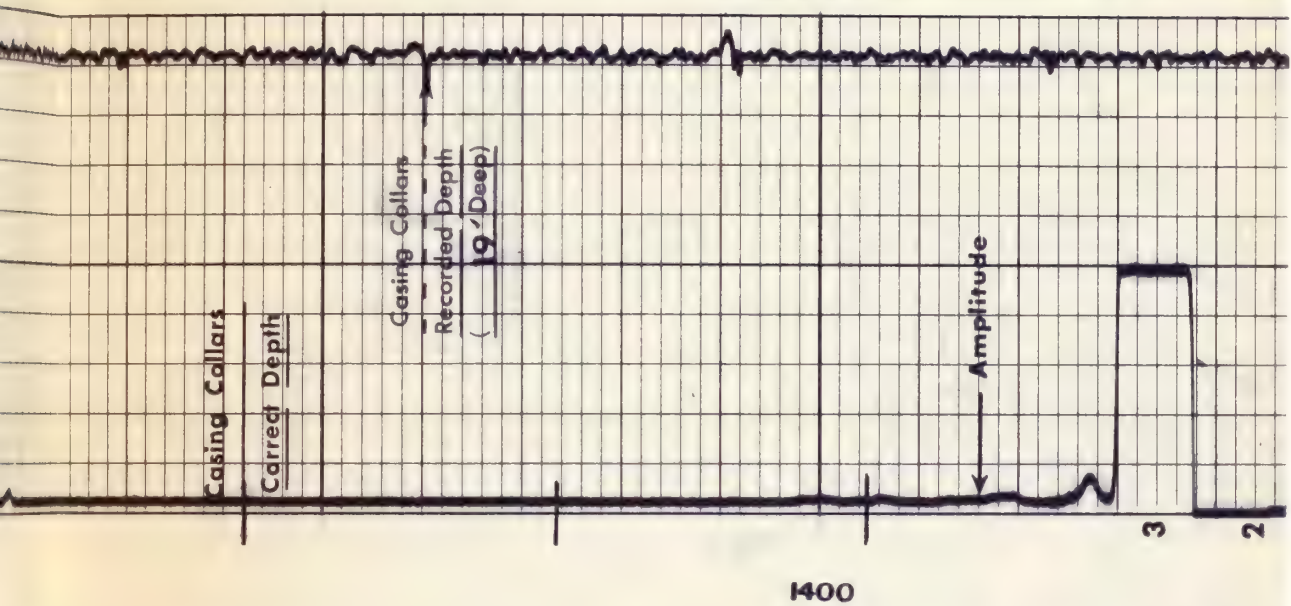
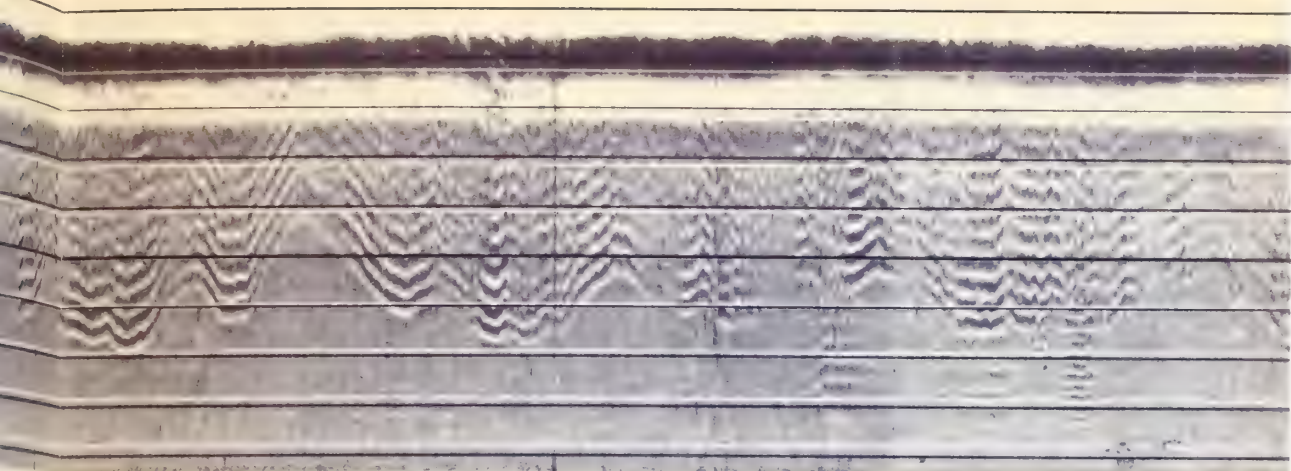


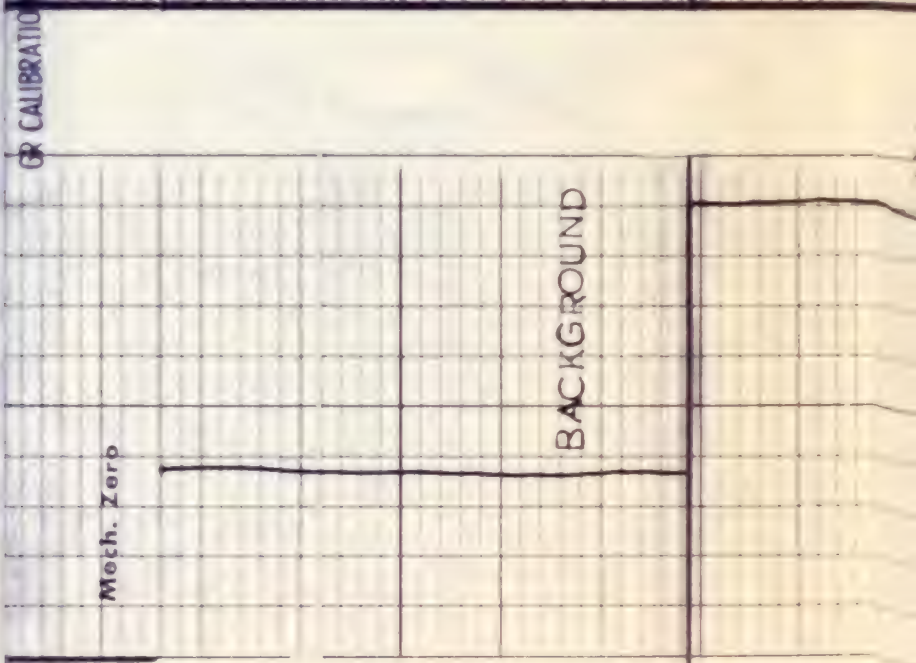
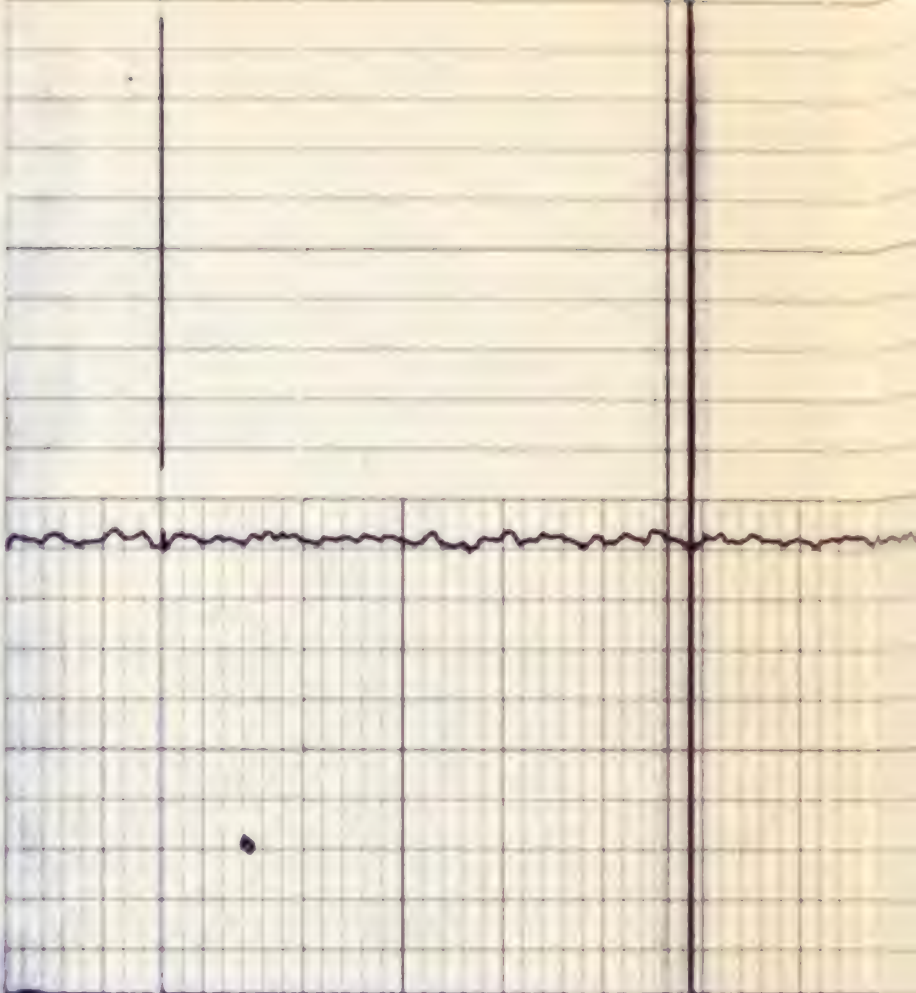
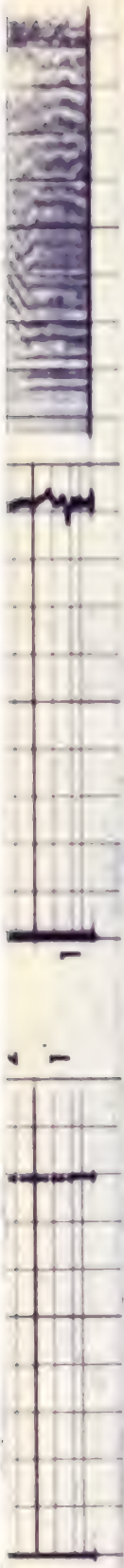


1300









TEST SOURCE

Elec. Zero

Mech. Zero

TRANSIT TIME

MICROSECONDS _____ SPACING _____
400 _____ 200 _____

GAMMA RAY

API UNITS

DEPTH

Casing Collars

Corrected Depth

CASING BOND

MILLIVOLTS

0 100

VARIABLE DENSITY

MICROSECONDS _____ 5 FT. SPACING

200 1200

COMPANY

ATLANTIC RICHFIELD COMPANY

SCHL. FR 1456

SCHL. TD 1464

DRLR TD 1469

WELL

CD-NO.4

Elev:

FIELD

COUNTY

RIO BLANCO

STATE

COLORADO

KB

DF

GL

CEMENT BOND CALIBRATION CODING

| Δ f | | AMPLITUDE |
|-----|-----------------|-----------------|
| 1 | MECHANICAL ZERO | MECHANICAL ZERO |
| 2 | 240 sec | ELECTRICAL ZERO |
| 3 | 320 sec | CALIBRATE |
| 4 | 400 sec | |

Schlumberger

PERFORATING DEPTH CONTROL

| COUNTY <u>RIO BLANCO</u> FIELD or LOCATION <u>SURF</u> WELL <u>S.W. 1</u> COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> WELL <u>S.W. 1</u> FIELD <u>SURF</u> COUNTY <u>RIO BLANCO STATE</u> <u>COLORADO</u> <div style="display: flex; justify-content: space-between;"> <div style="width: 70%;"> Location <u>1940' FEB 9 1914' FSL</u> Sec. <u> </u> Twp. <u>35</u> Rge. <u>07</u> </div> <div style="width: 25%;"> Other Services: <u> </u> <u> </u> </div> </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|------------------|----------------|-------------|---------------|----------|--------------|-----------------|----------------------|----------------|----------------------|------------------------|----------------------|---------------------|---------------------|--------------------|--------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------------------|-------------|--------------------|--------------------|-------------|-------------------|--------------|--------------------|------------|------------|-------------|------------|
| Permanent Datum: <u>GROUND LEVEL</u> ; Elev.: <u>64.3</u> Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum Drilling Measured From <u>GL</u> | | Elev.: K.B. <u> </u> D.F. <u> </u> G.L. <u>64</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Date</td><td><u>4/11/75</u></td></tr> <tr><td>Run No.</td><td><u>17 ONE</u></td></tr> <tr><td>Type Log</td><td><u>BARNA</u></td></tr> <tr><td>Depth — Driller</td><td><u>2519 --- 12.4</u></td></tr> <tr><td>Depth — Logger</td><td><u>2400 --- 1.40</u></td></tr> <tr><td>Bottom logged interval</td><td><u>2412 --- 1.22</u></td></tr> <tr><td>Top logged interval</td><td><u>200 --- 6.20</u></td></tr> <tr><td>Type fluid in hole</td><td><u>WATER</u></td></tr> <tr><td>Salinity, PPM Cl.</td><td><u> </u></td></tr> <tr><td>Density</td><td><u> </u></td></tr> <tr><td>Level</td><td><u>FULL</u></td></tr> <tr><td>Max. rec. temp., deg F.</td><td><u> </u></td></tr> <tr><td>Operating rig time</td><td><u>THREE HOURS</u></td></tr> <tr><td>Recorded By</td><td><u>ST. AUSTIN</u></td></tr> <tr><td>Witnessed By</td><td><u>DR. G. TAIT</u></td></tr> </table> | | | Date | <u>4/11/75</u> | Run No. | <u>17 ONE</u> | Type Log | <u>BARNA</u> | Depth — Driller | <u>2519 --- 12.4</u> | Depth — Logger | <u>2400 --- 1.40</u> | Bottom logged interval | <u>2412 --- 1.22</u> | Top logged interval | <u>200 --- 6.20</u> | Type fluid in hole | <u>WATER</u> | Salinity, PPM Cl. | <u> </u> | Density | <u> </u> | Level | <u>FULL</u> | Max. rec. temp., deg F. | <u> </u> | Operating rig time | <u>THREE HOURS</u> | Recorded By | <u>ST. AUSTIN</u> | Witnessed By | <u>DR. G. TAIT</u> | | | | |
| Date | <u>4/11/75</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Run No. | <u>17 ONE</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type Log | <u>BARNA</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth — Driller | <u>2519 --- 12.4</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth — Logger | <u>2400 --- 1.40</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bottom logged interval | <u>2412 --- 1.22</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Top logged interval | <u>200 --- 6.20</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Type fluid in hole | <u>WATER</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Salinity, PPM Cl. | <u> </u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Density | <u> </u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Level | <u>FULL</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Max. rec. temp., deg F. | <u> </u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating rig time | <u>THREE HOURS</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Recorded By | <u>ST. AUSTIN</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Witnessed By | <u>DR. G. TAIT</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">BORE-HOLE RECORD</th> <th colspan="3">CASING RECORD</th> </tr> <tr> <th>Bit Size</th> <th>From</th> <th>To</th> <th>Size</th> <th>Wgt.</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td><u>7/8</u></td> <td><u>SURF</u></td> <td><u>154</u></td> <td><u>5/8</u></td> <td><u> </u></td> <td><u>SURF</u></td> <td><u>154</u></td> </tr> <tr> <td><u> </u></td> <td><u> </u></td> <td><u>112</u></td> <td><u>3/8</u></td> <td><u>4.7</u></td> <td><u>SURF</u></td> <td><u>112</u></td> </tr> <tr> <td><u> </u></td> <td><u> </u></td> <td><u>107</u></td> <td><u>3/8</u></td> <td><u>4.7</u></td> <td><u>SURF</u></td> <td><u>107</u></td> </tr> </tbody> </table> | | | BORE-HOLE RECORD | | | CASING RECORD | | | Bit Size | From | To | Size | Wgt. | From | To | <u>7/8</u> | <u>SURF</u> | <u>154</u> | <u>5/8</u> | <u> </u> | <u>SURF</u> | <u>154</u> | <u> </u> | <u> </u> | <u>112</u> | <u>3/8</u> | <u>4.7</u> | <u>SURF</u> | <u>112</u> | <u> </u> | <u> </u> | <u>107</u> | <u>3/8</u> | <u>4.7</u> | <u>SURF</u> | <u>107</u> |
| BORE-HOLE RECORD | | | CASING RECORD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bit Size | From | To | Size | Wgt. | From | To | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>7/8</u> | <u>SURF</u> | <u>154</u> | <u>5/8</u> | <u> </u> | <u>SURF</u> | <u>154</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u> </u> | <u> </u> | <u>112</u> | <u>3/8</u> | <u>4.7</u> | <u>SURF</u> | <u>112</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u> </u> | <u> </u> | <u>107</u> | <u>3/8</u> | <u>4.7</u> | <u>SURF</u> | <u>107</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

FOLD HERE

The well name, location and benchtop reference data were furnished by the customer.

EQUIPMENT DATA

Gamma Ray

Run No.

Tool Model No.

Diameter

Def'r Model No.

Type

Length

S. O. No.

General

Hoist Truck No.

Inst. Truck No.

Tool Serial No.

Location

Remarks:

Casing Collars recorded

ft.

DEEP

, Corrected collar depths are shown in the depth track

GAMMA RAY

RADIOACTIVITY INCREASES

DEPTHS

GAMMA RAY

RADIOACTIVITY INCREASES

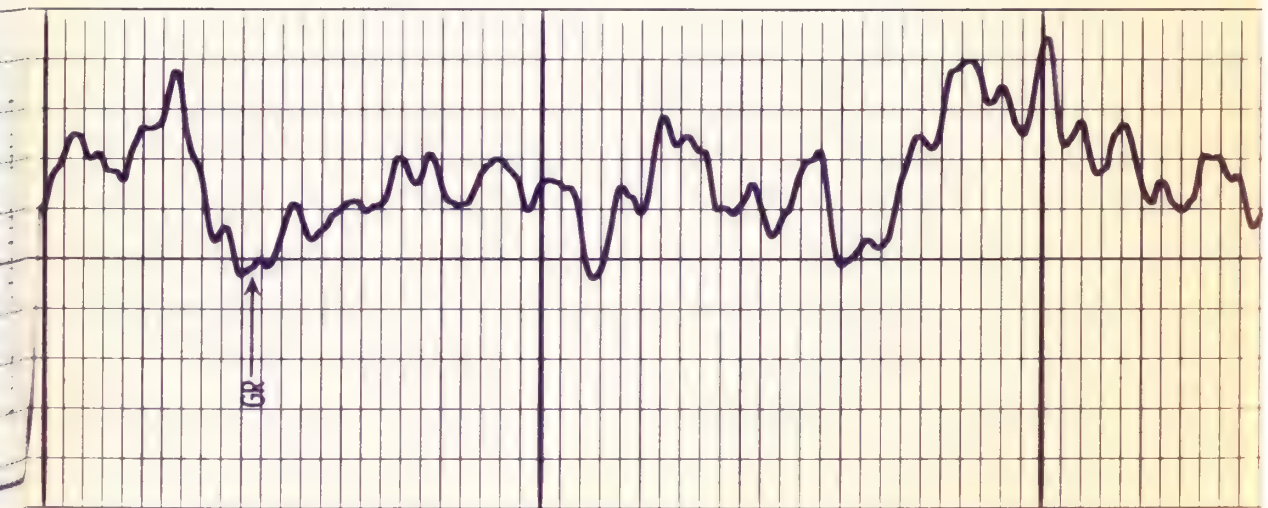
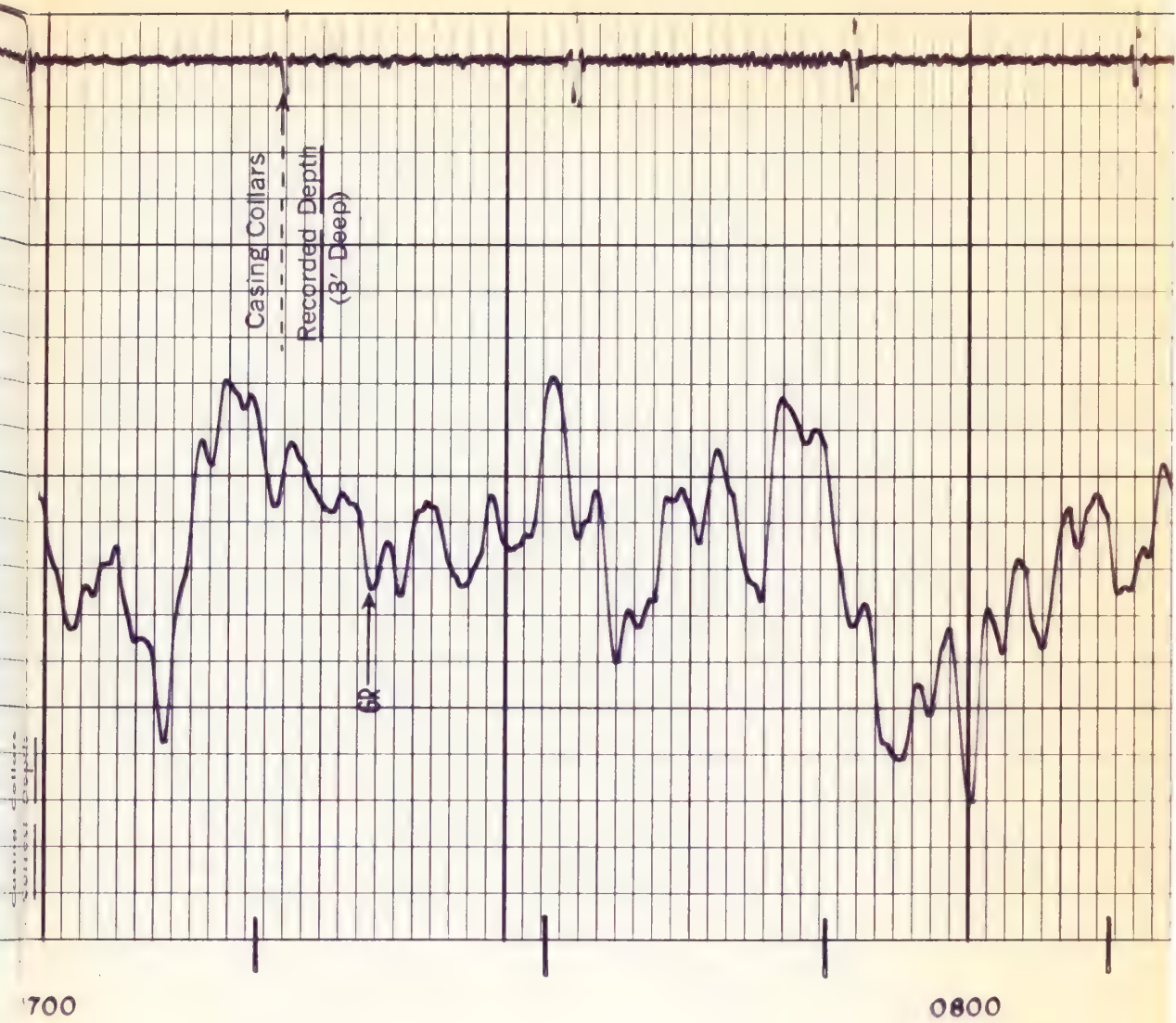
Casing Collars
Correct Depth

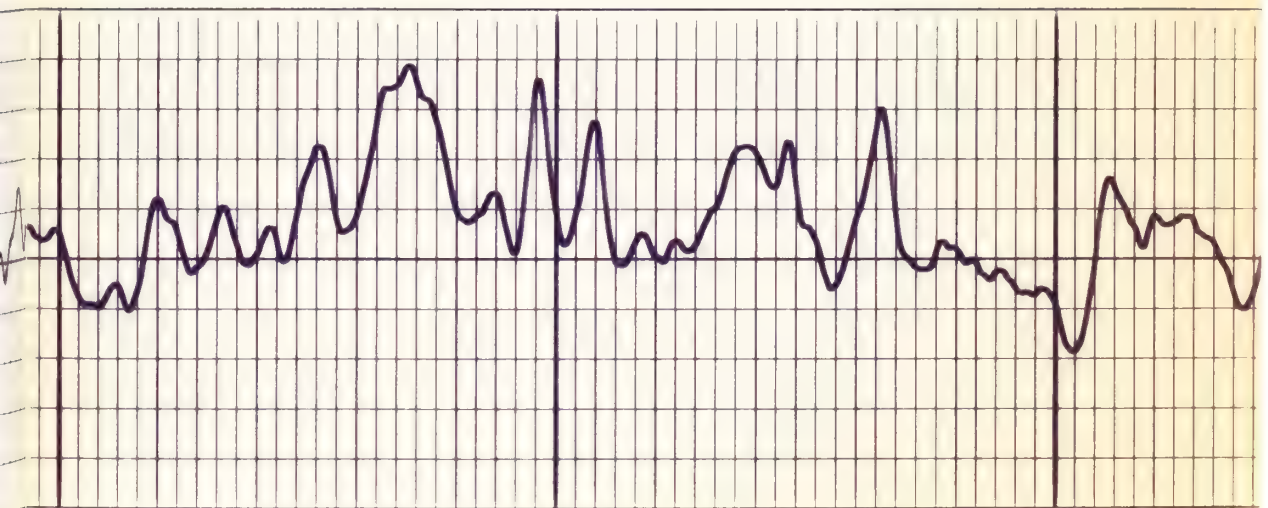
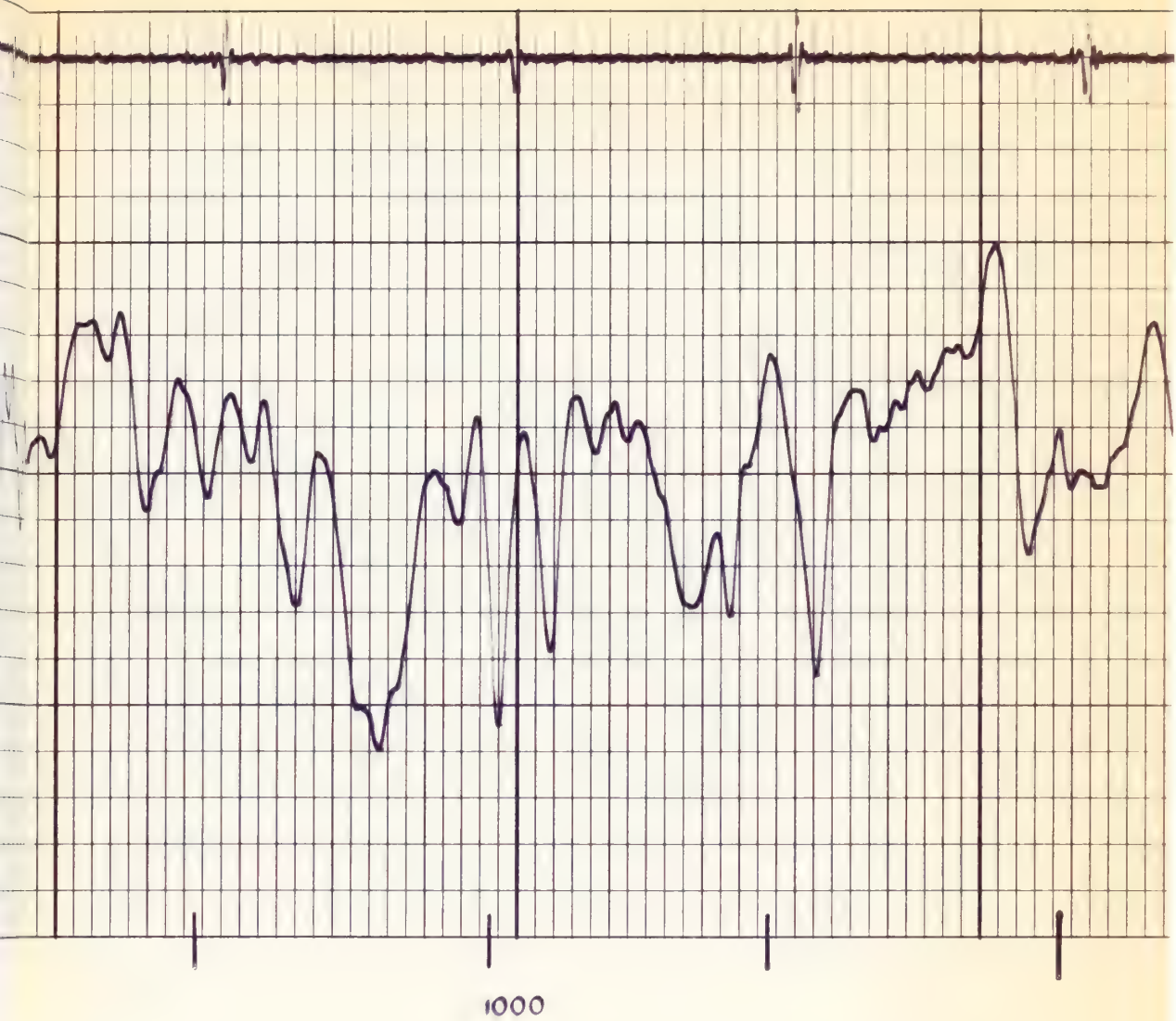
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Casing Collars

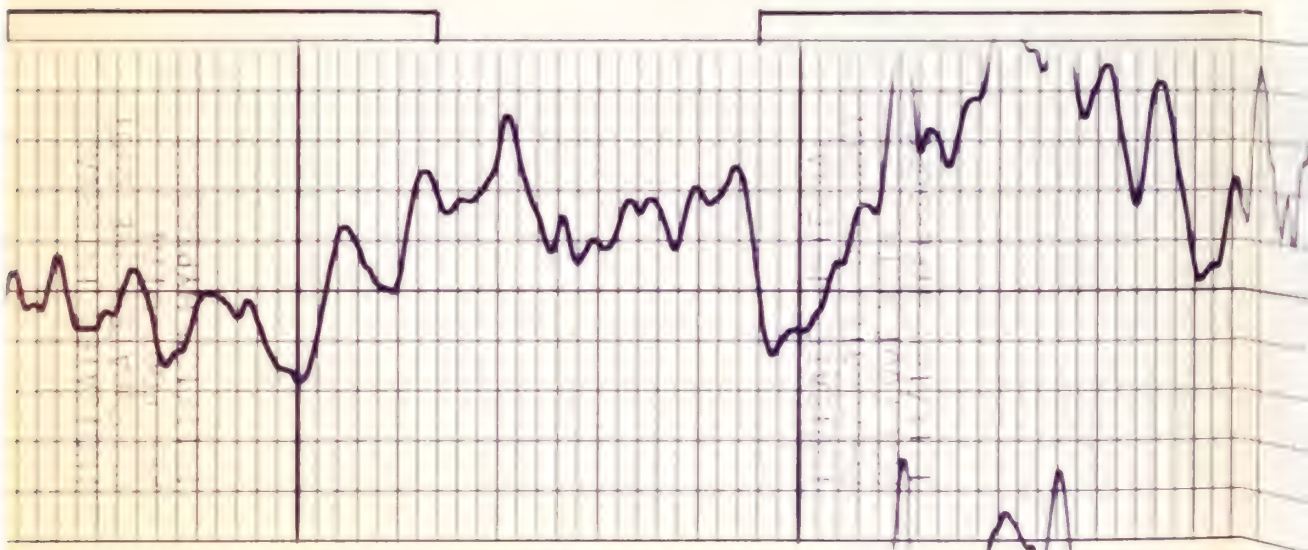
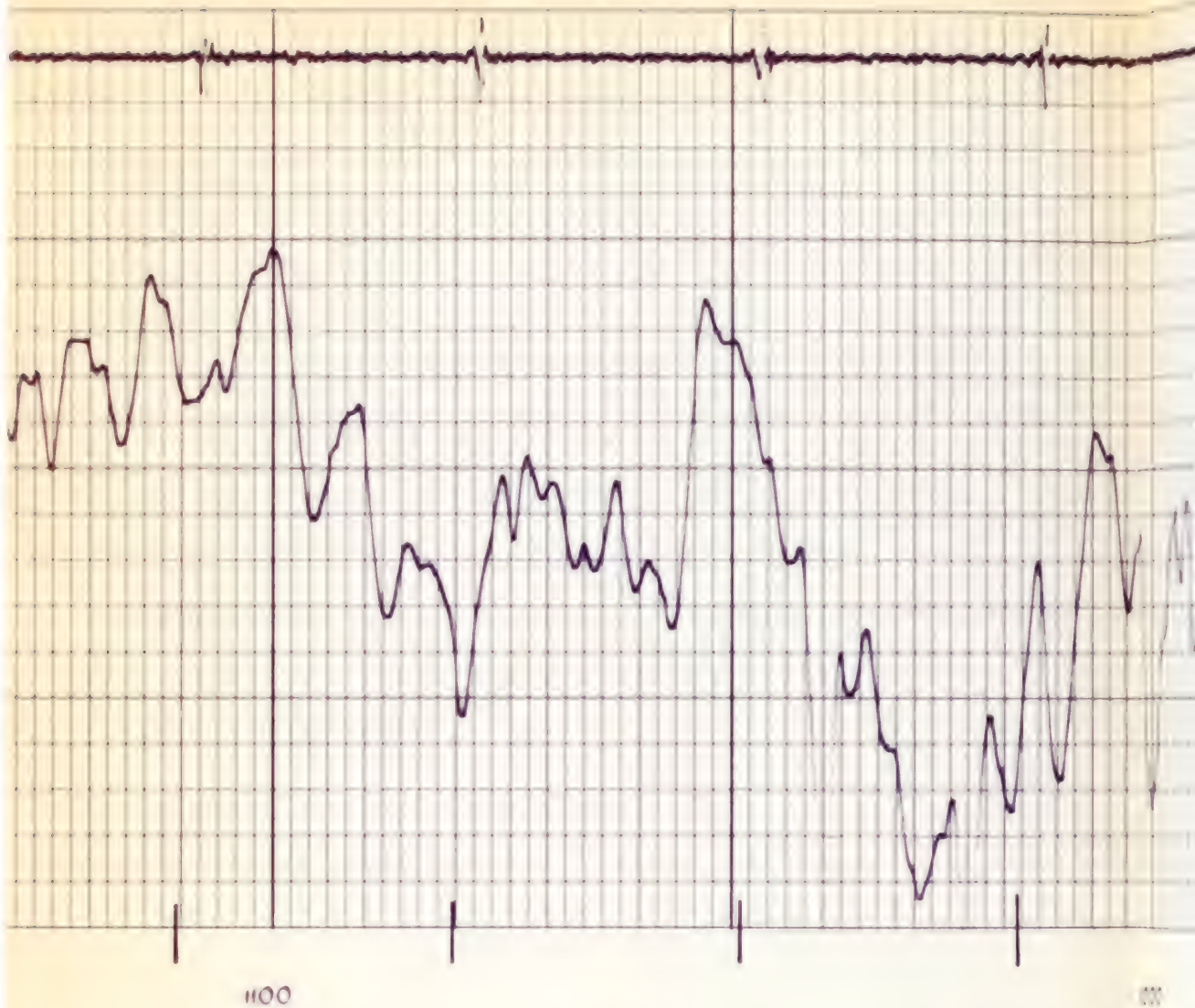
Casing Collars

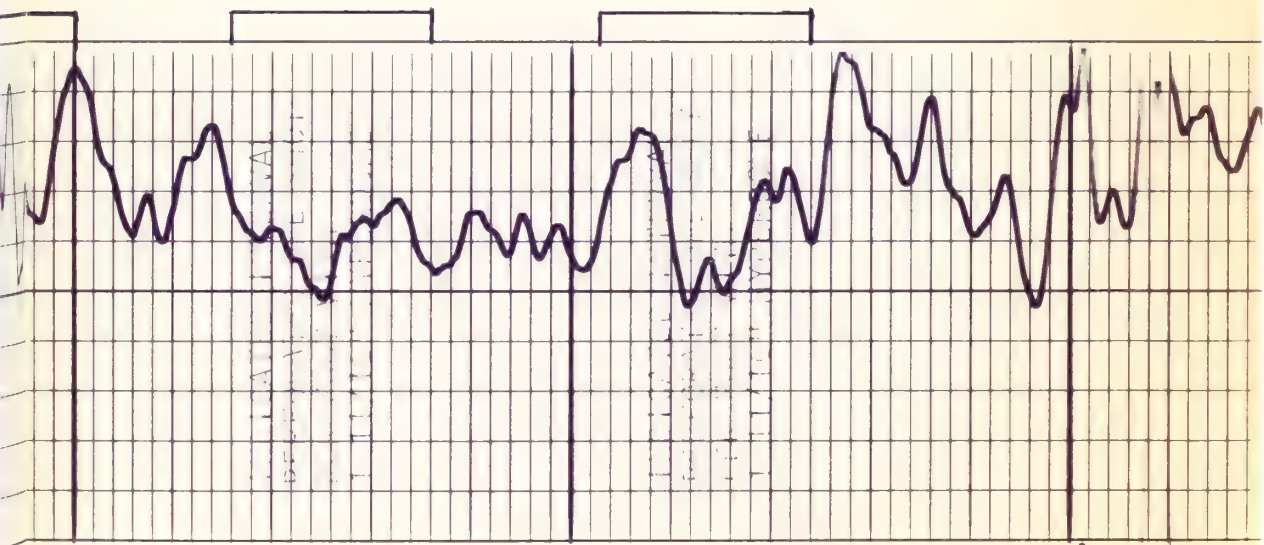
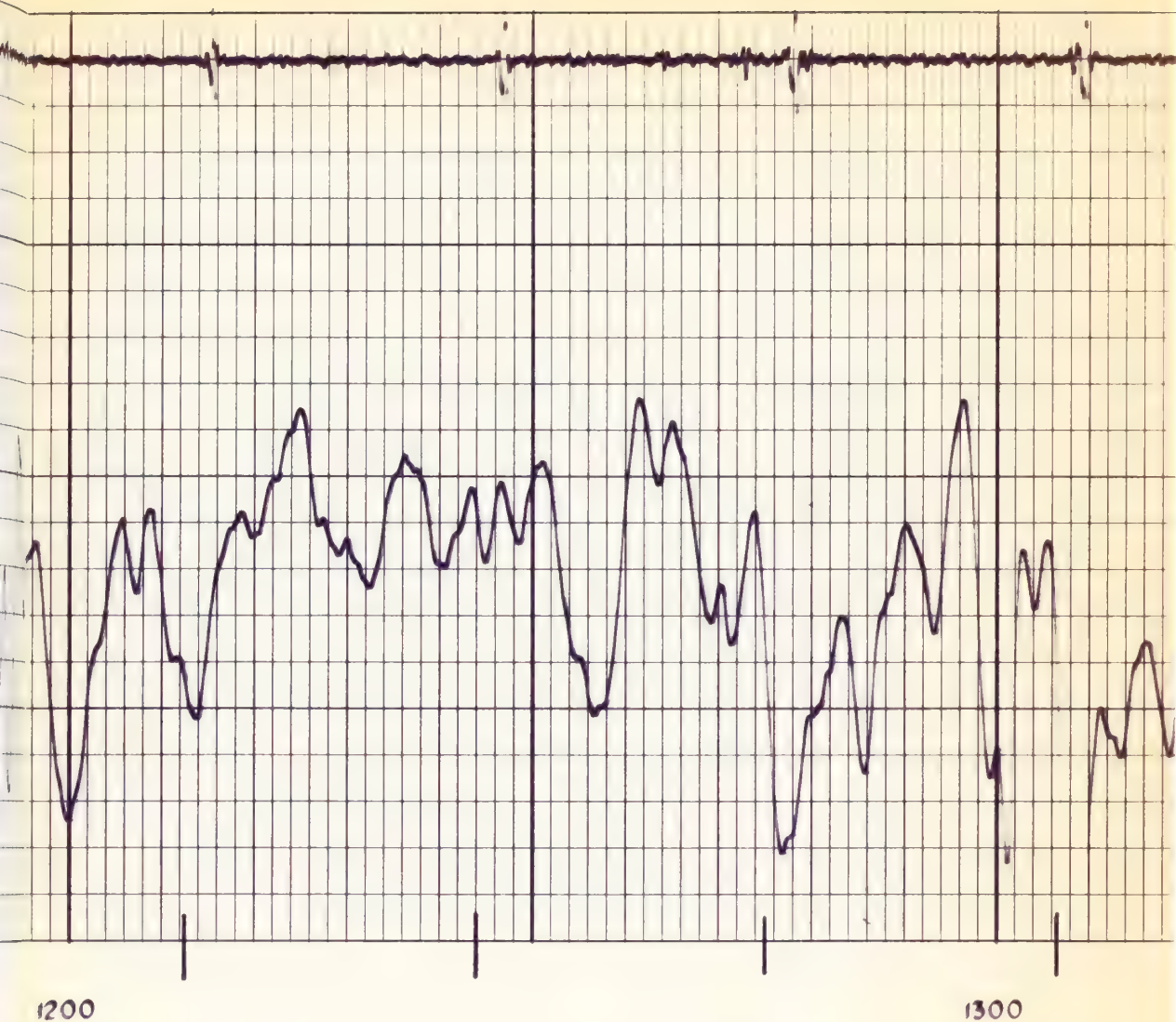
Correct Depth

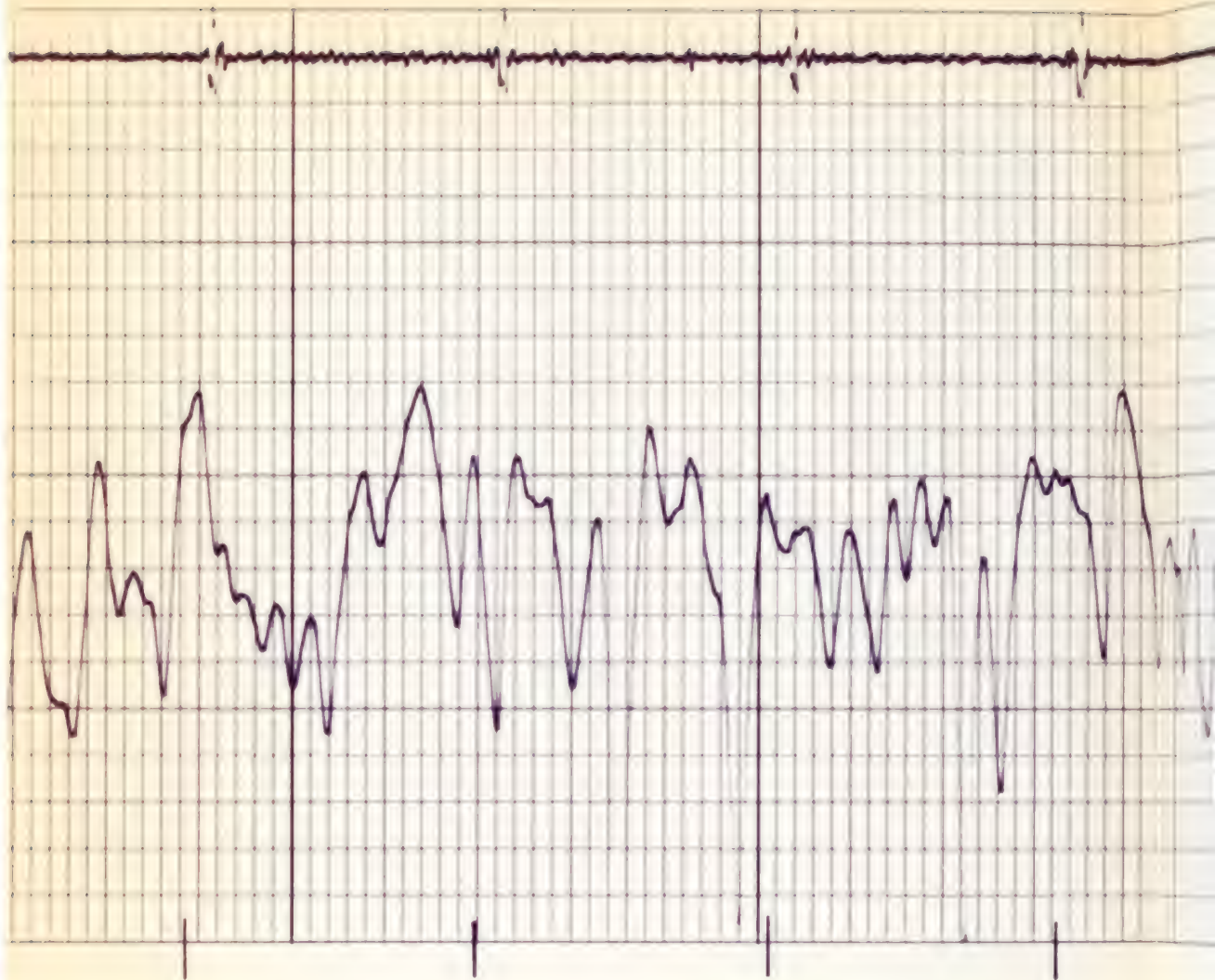
LONG STRING NO. 1



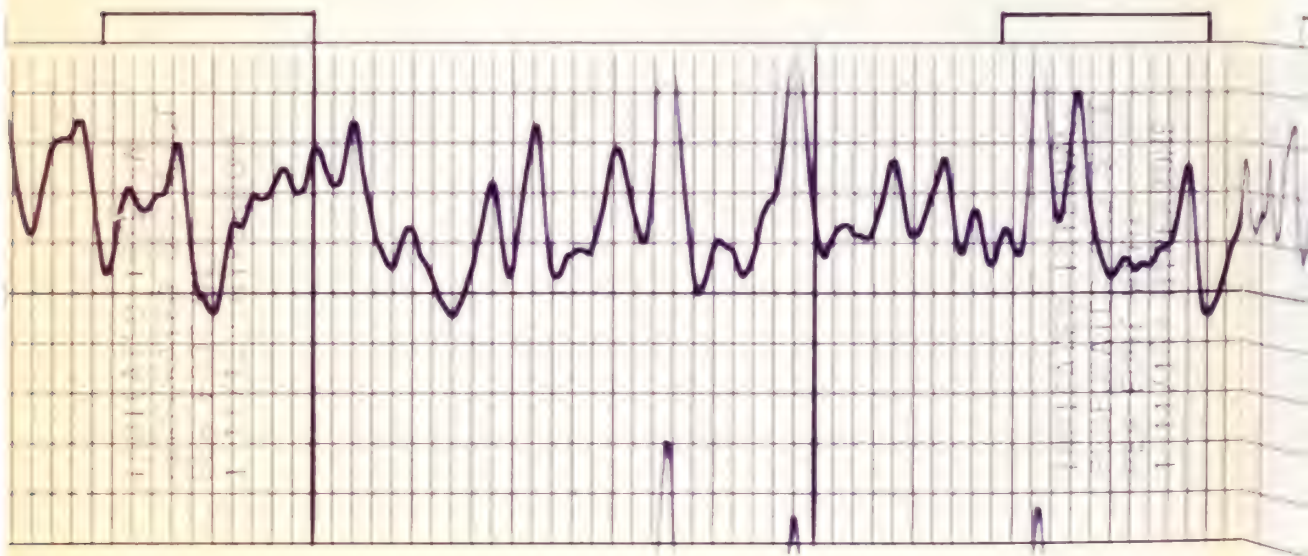


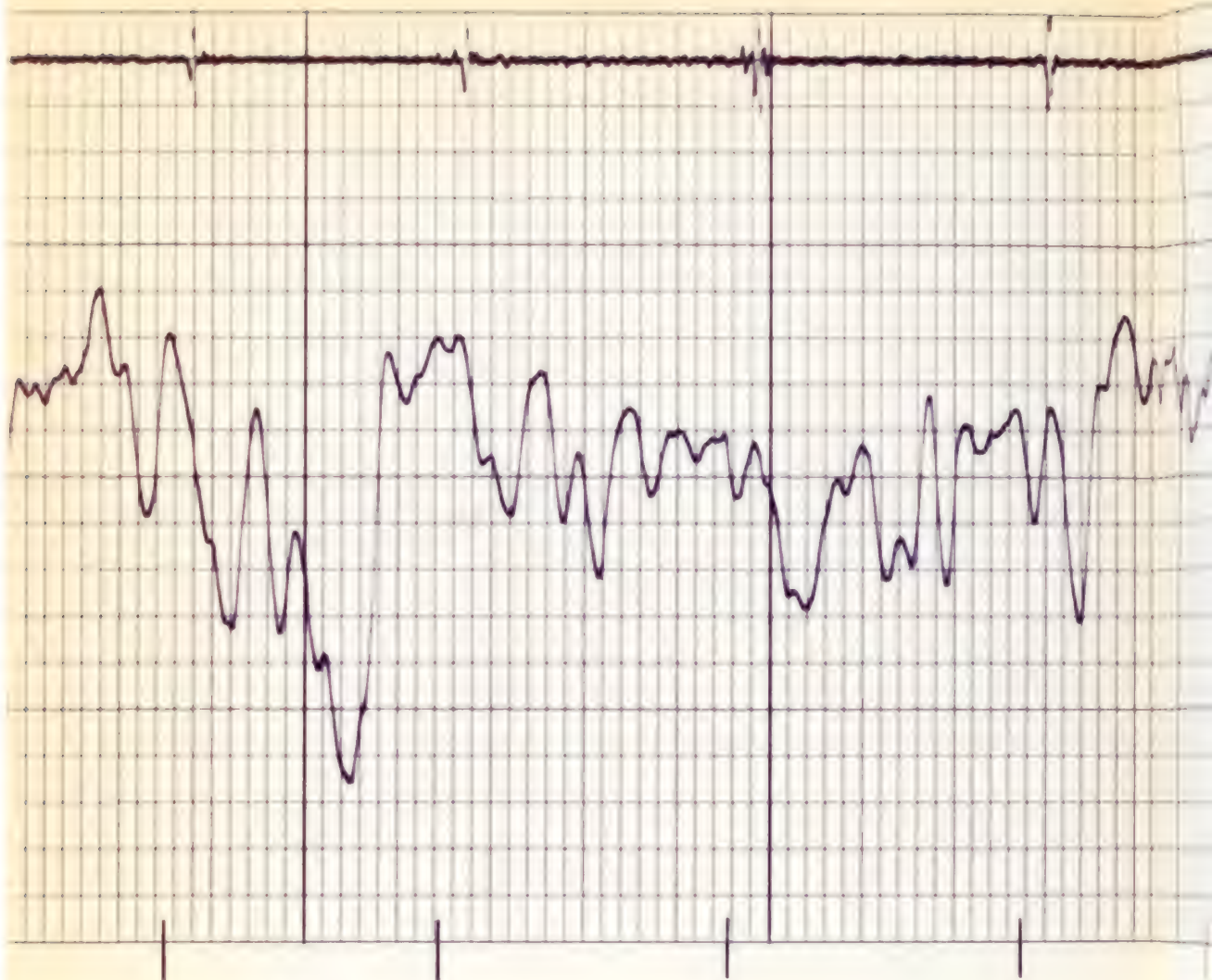




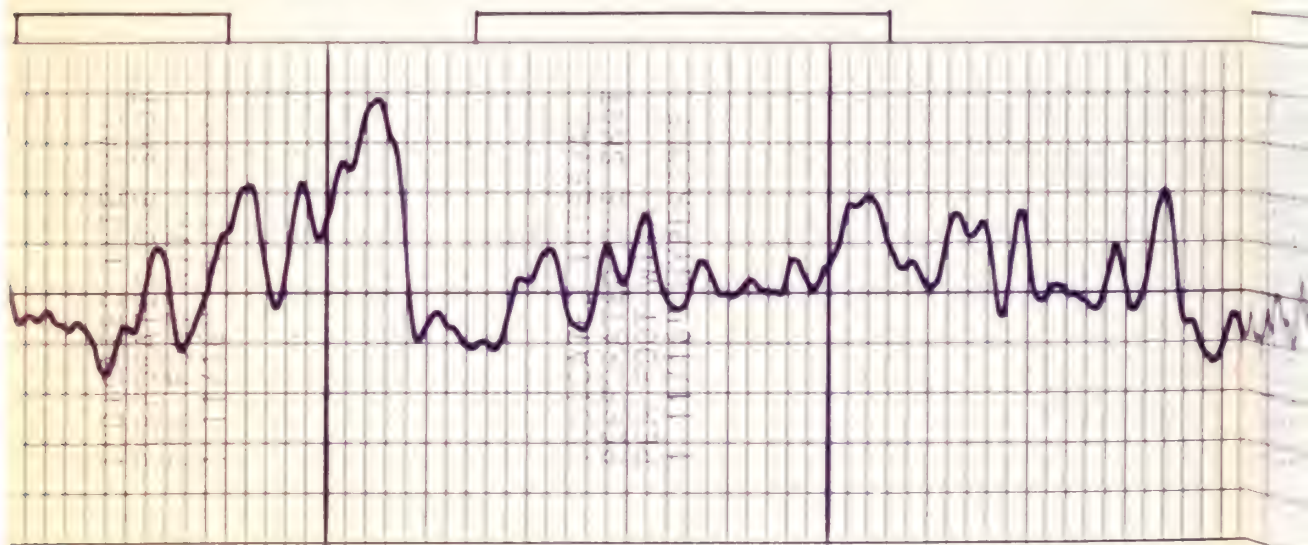


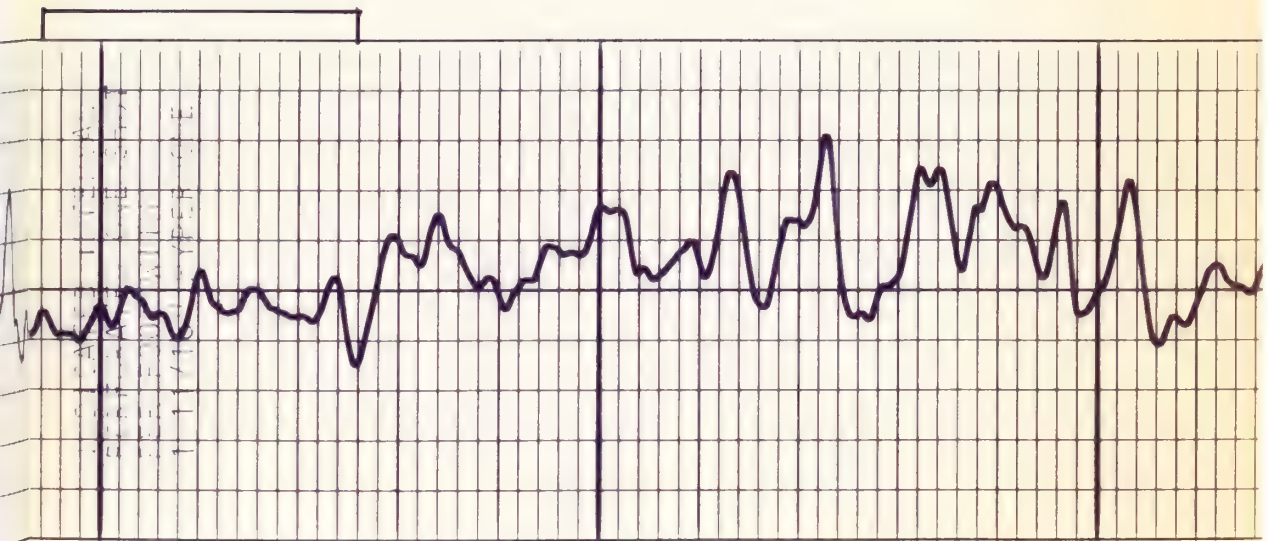
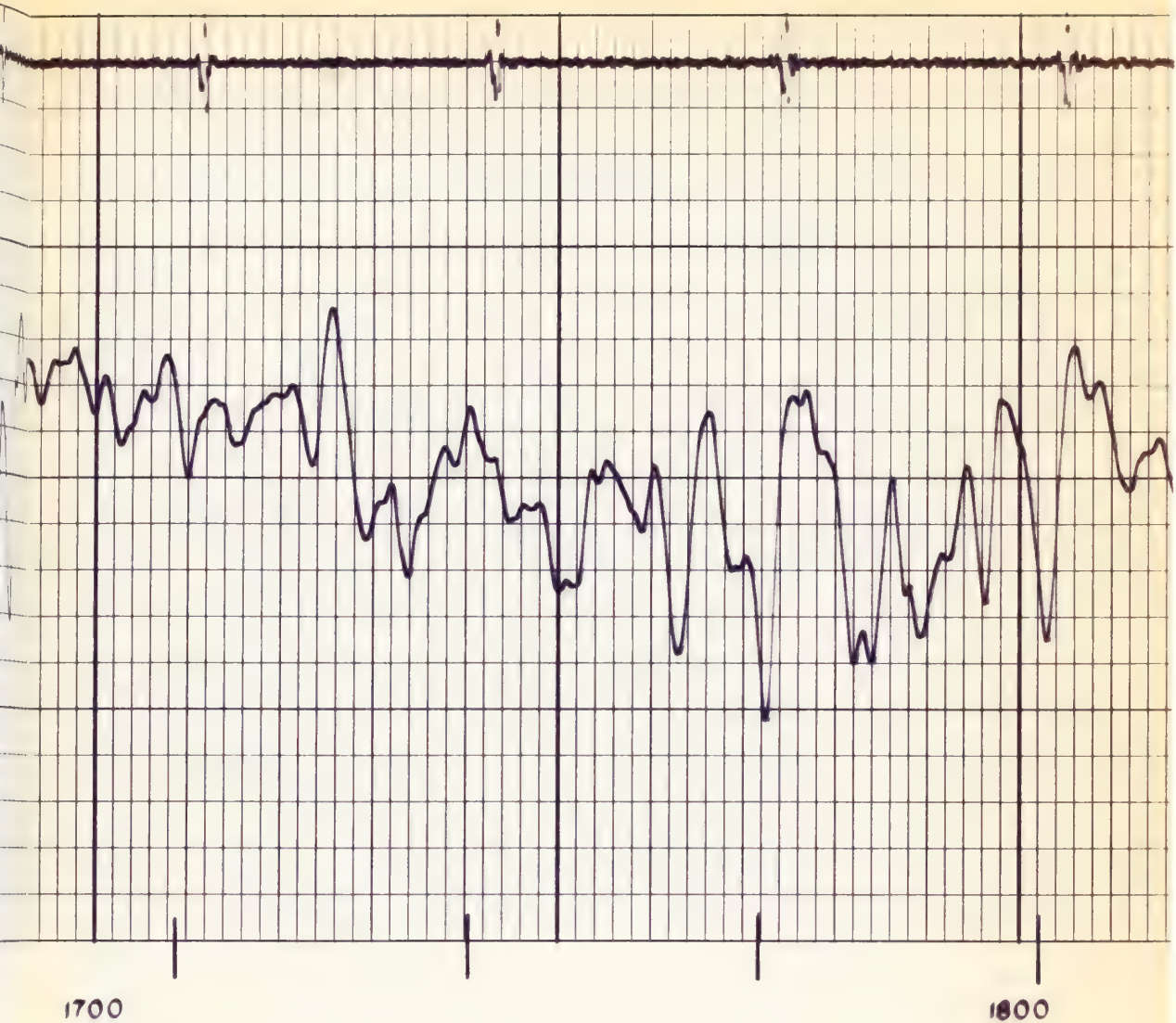
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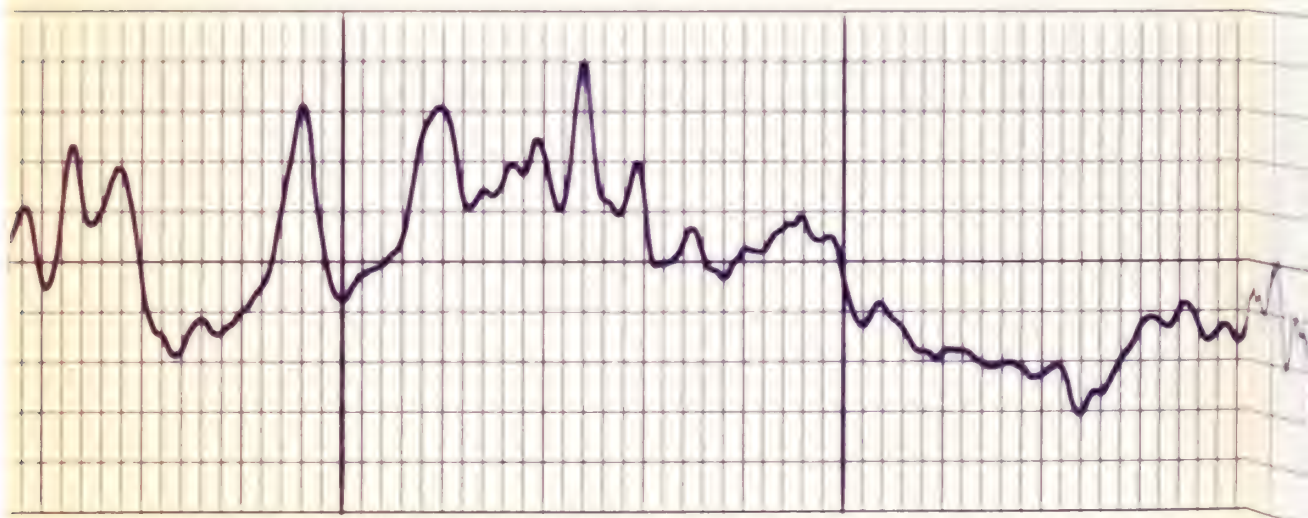
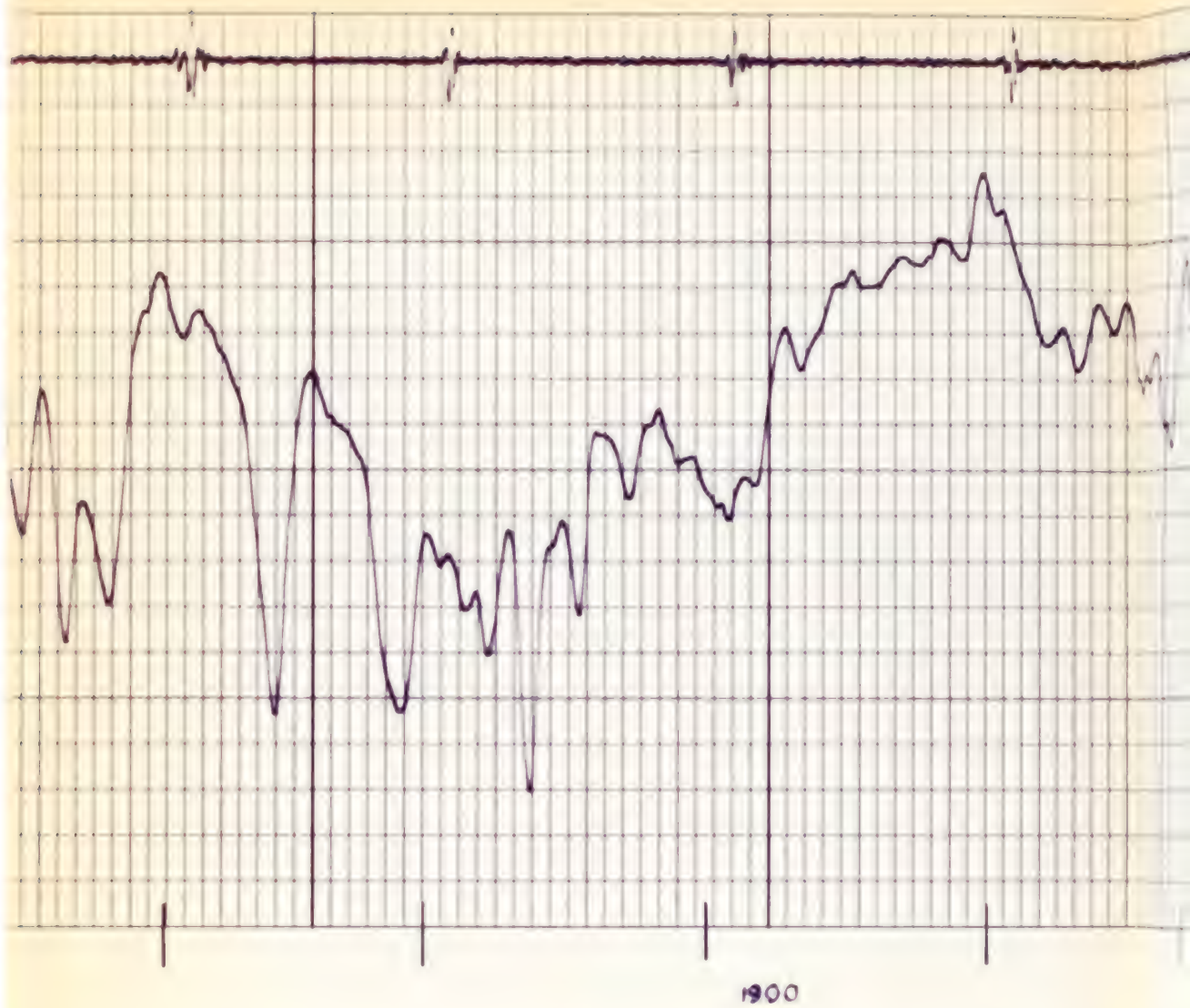


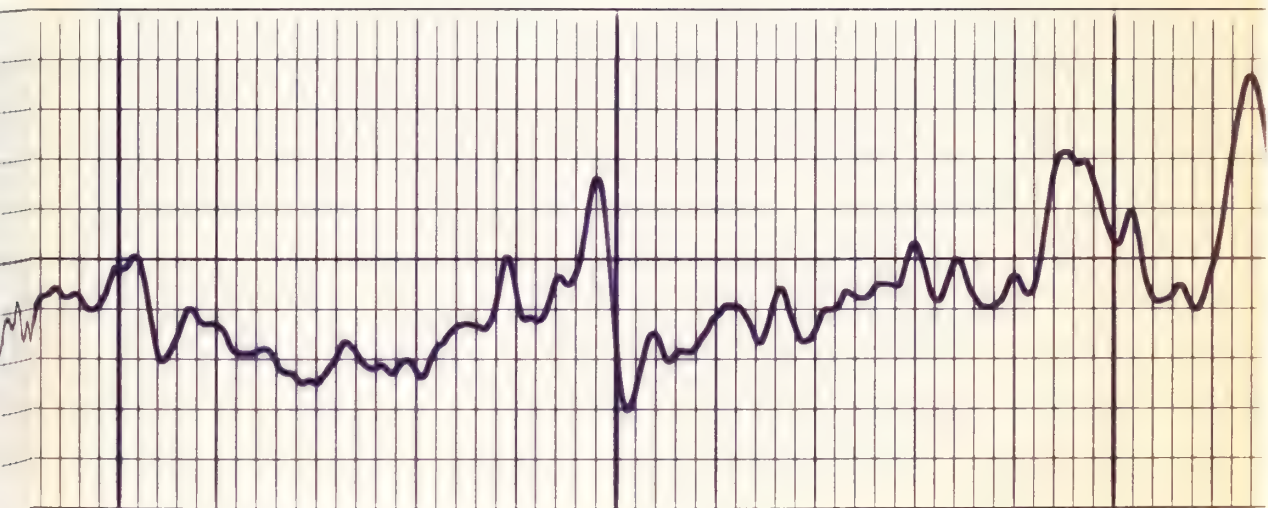
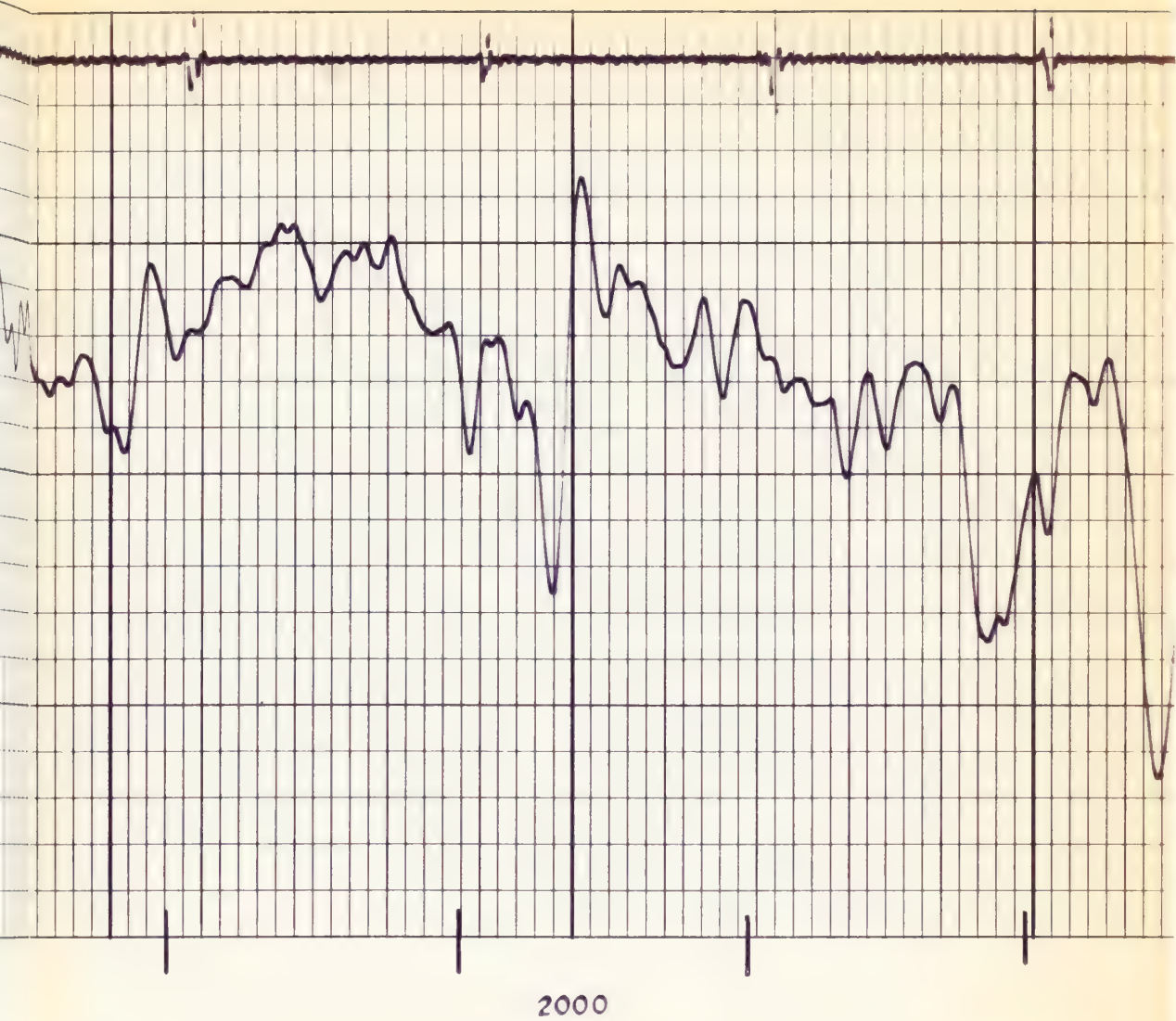


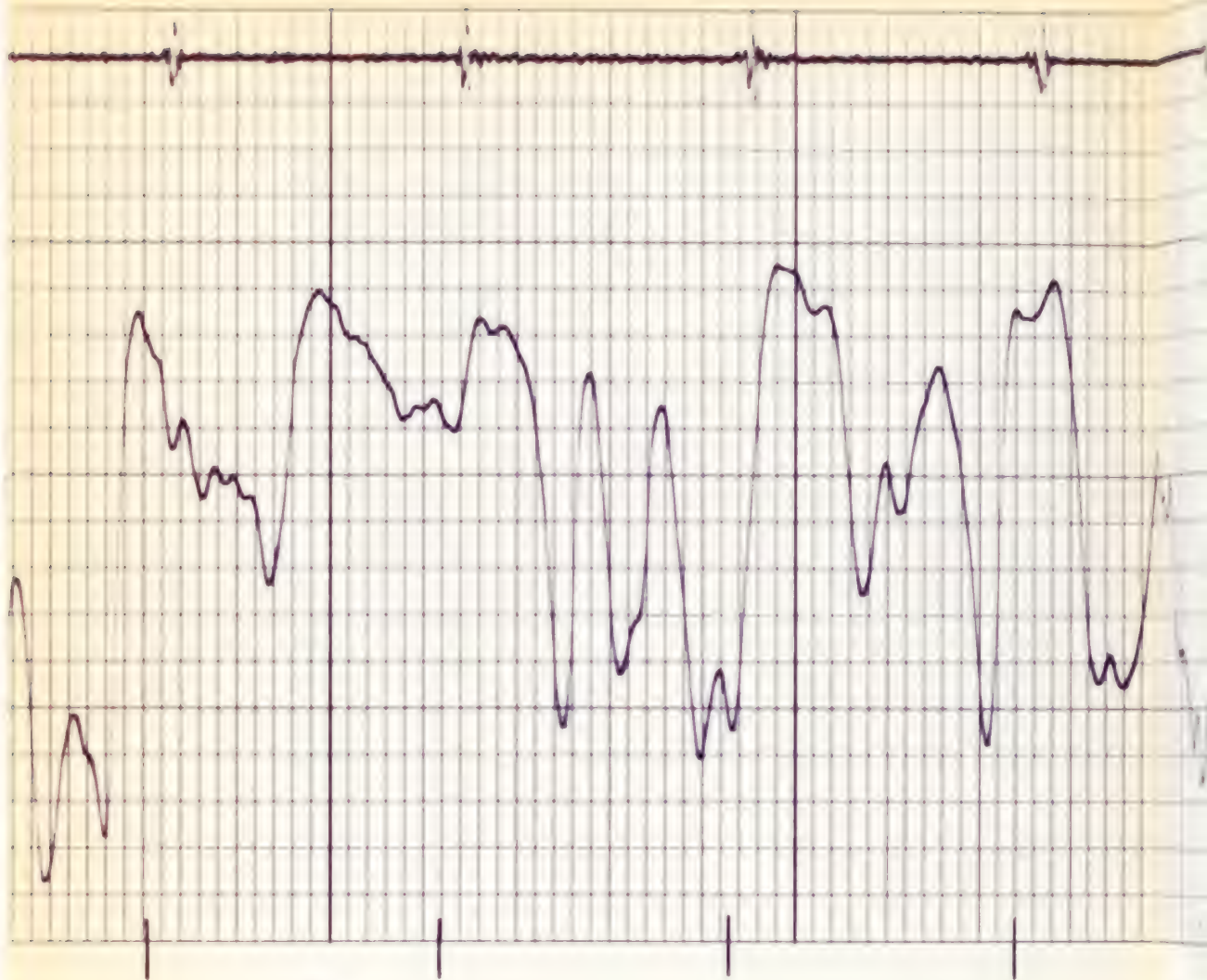
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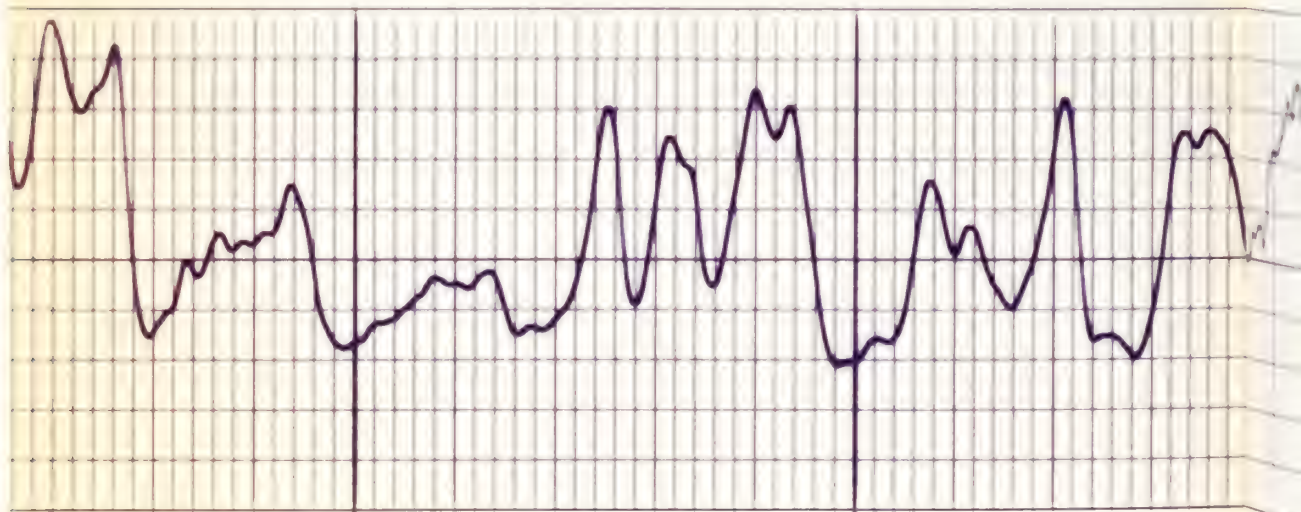


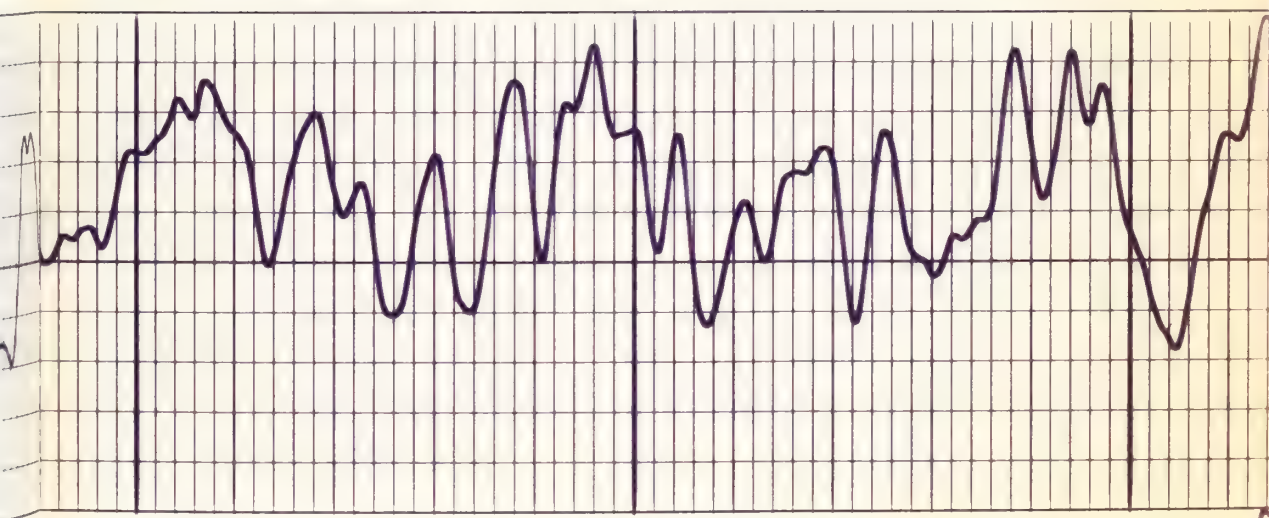
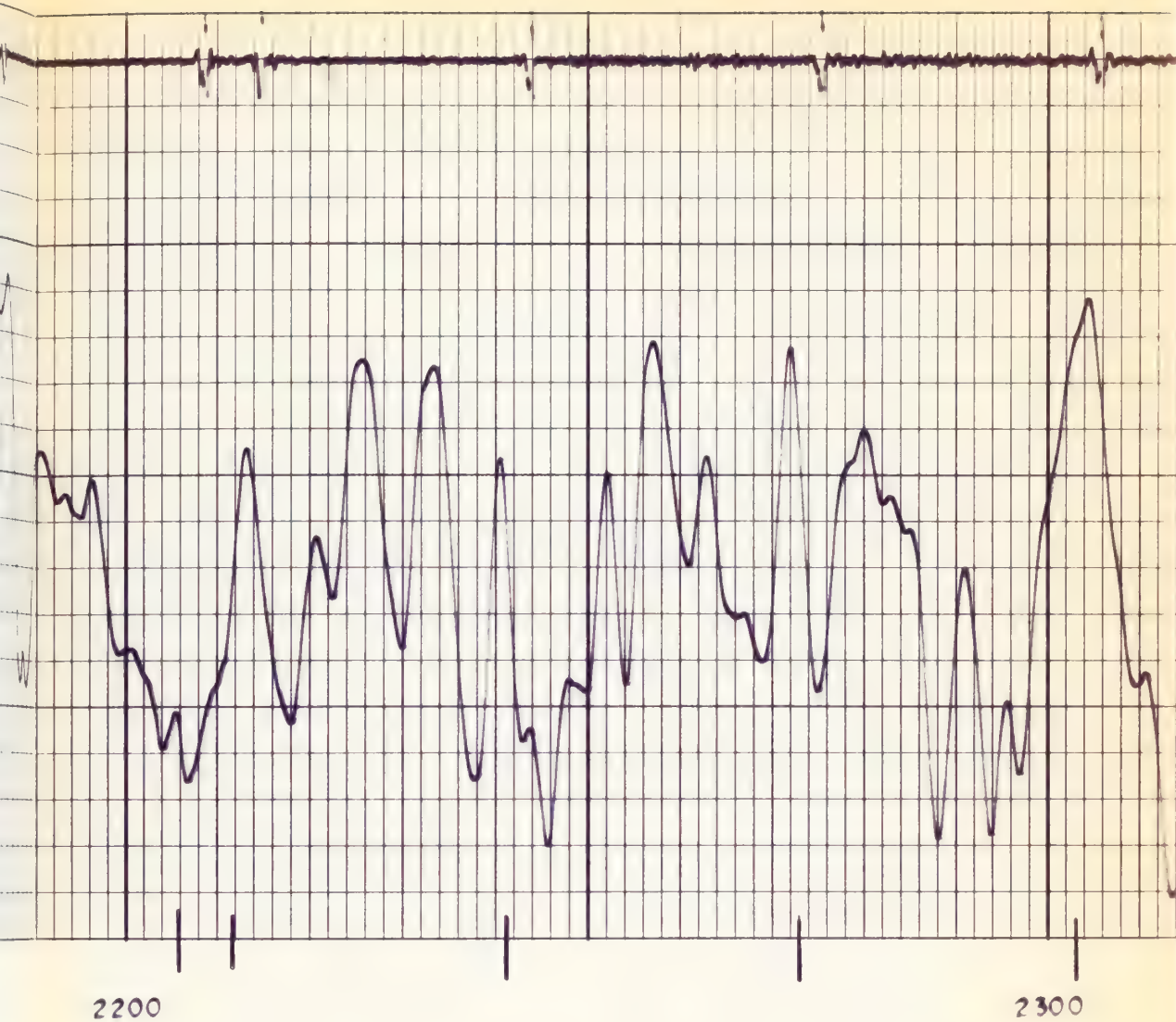


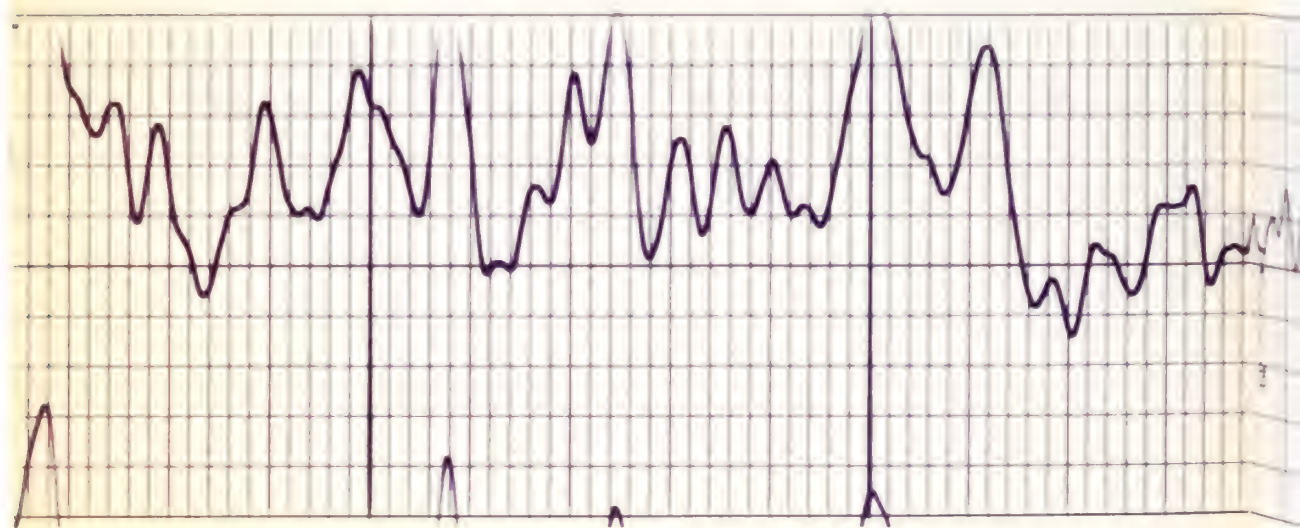
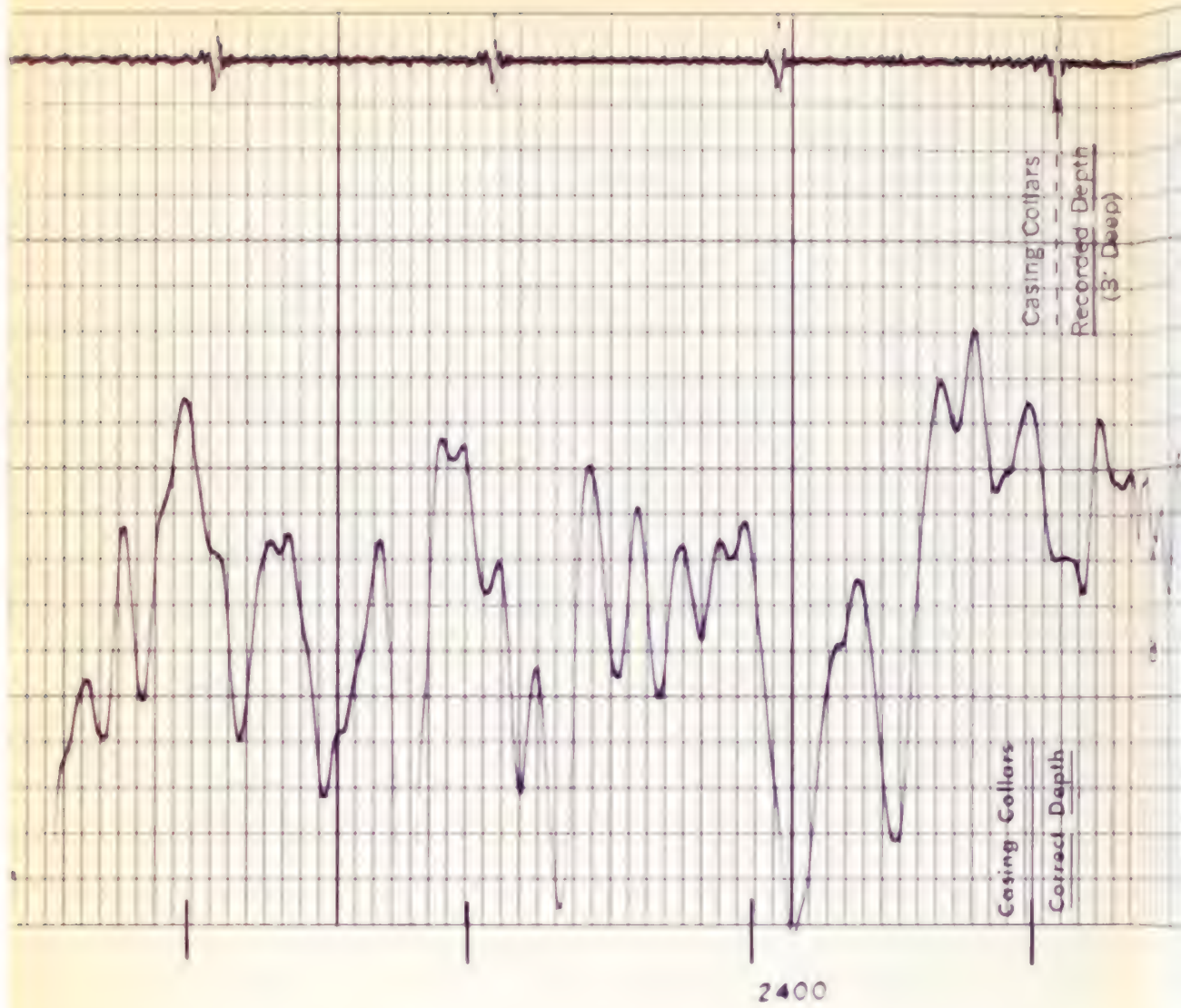


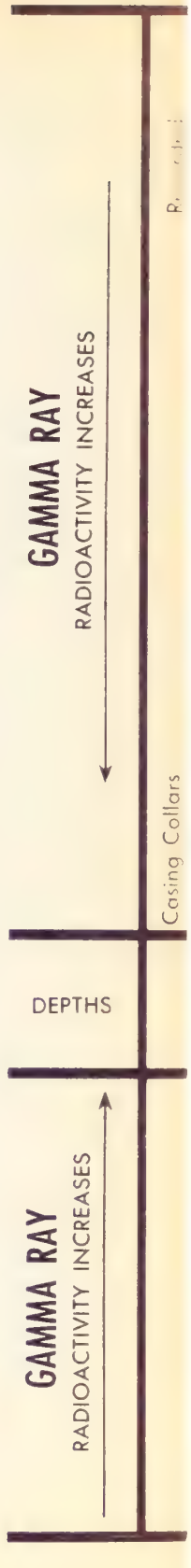
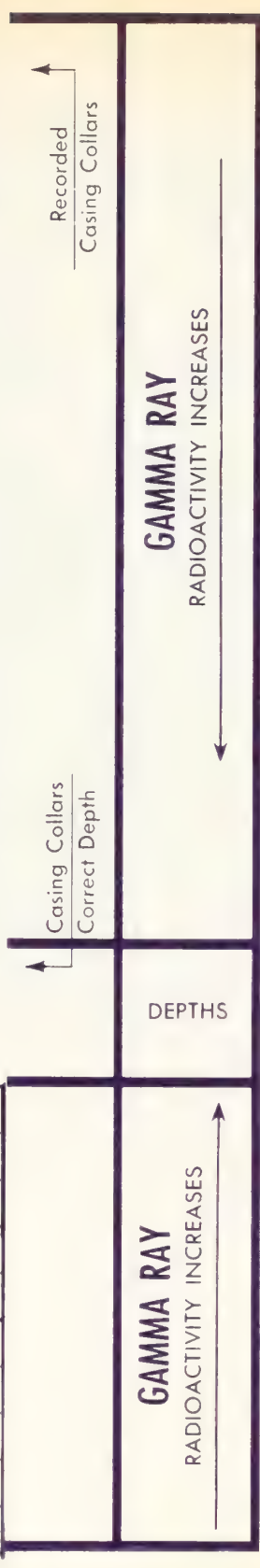
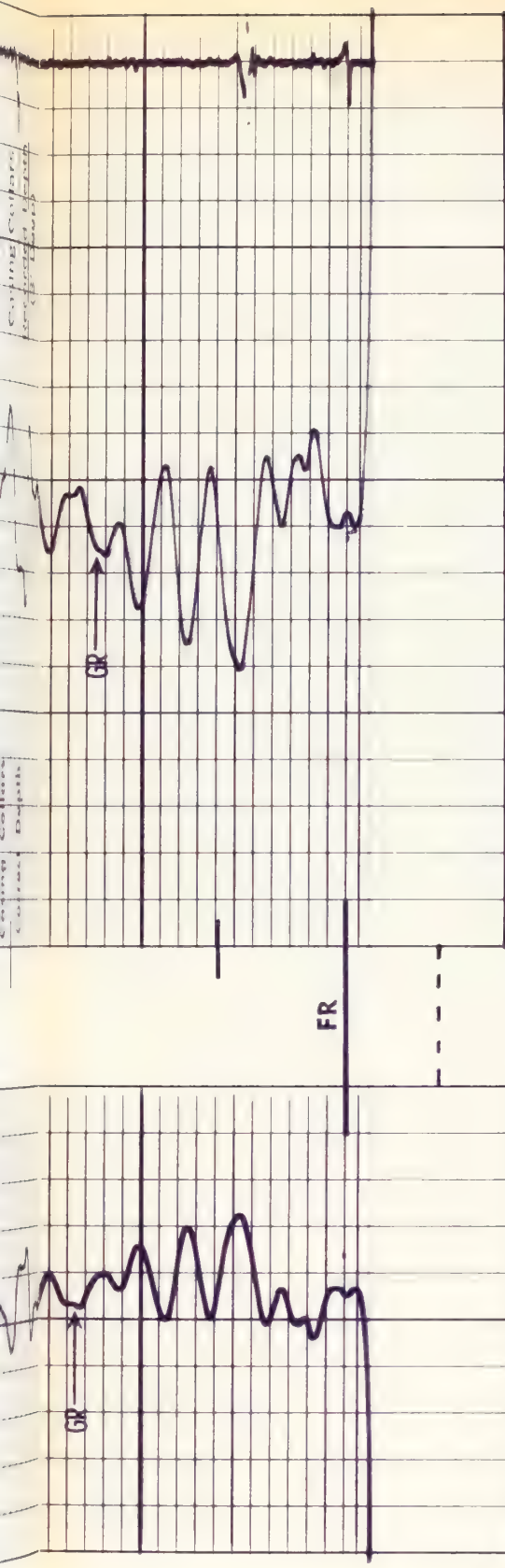


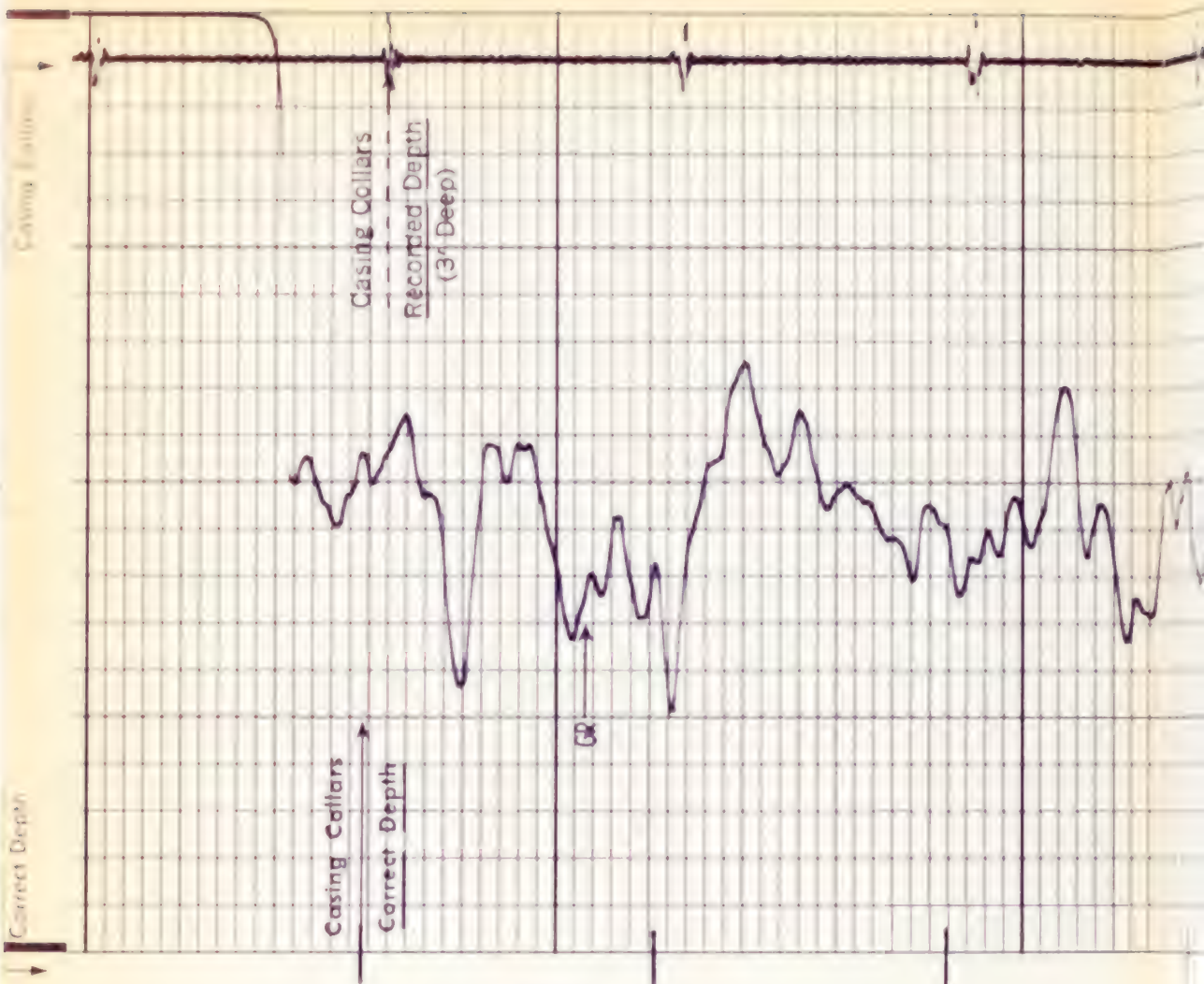
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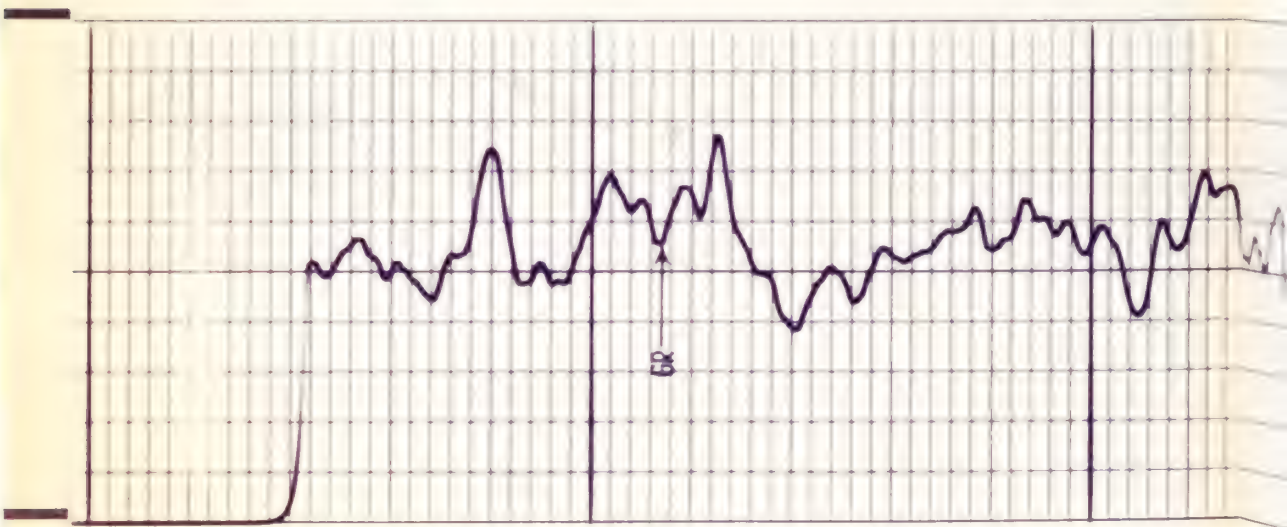


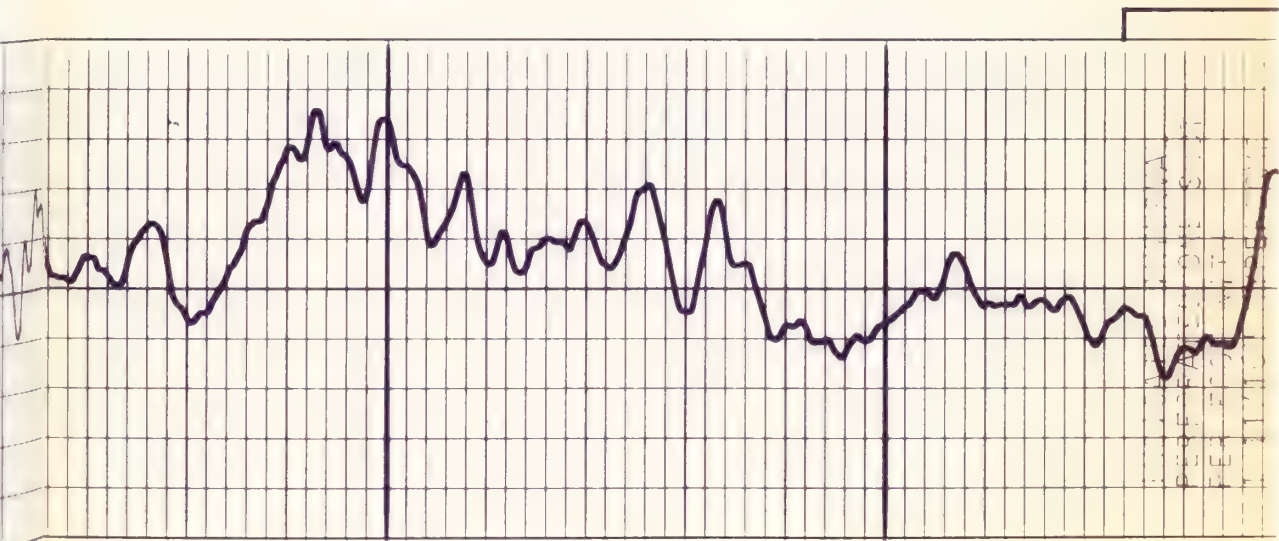
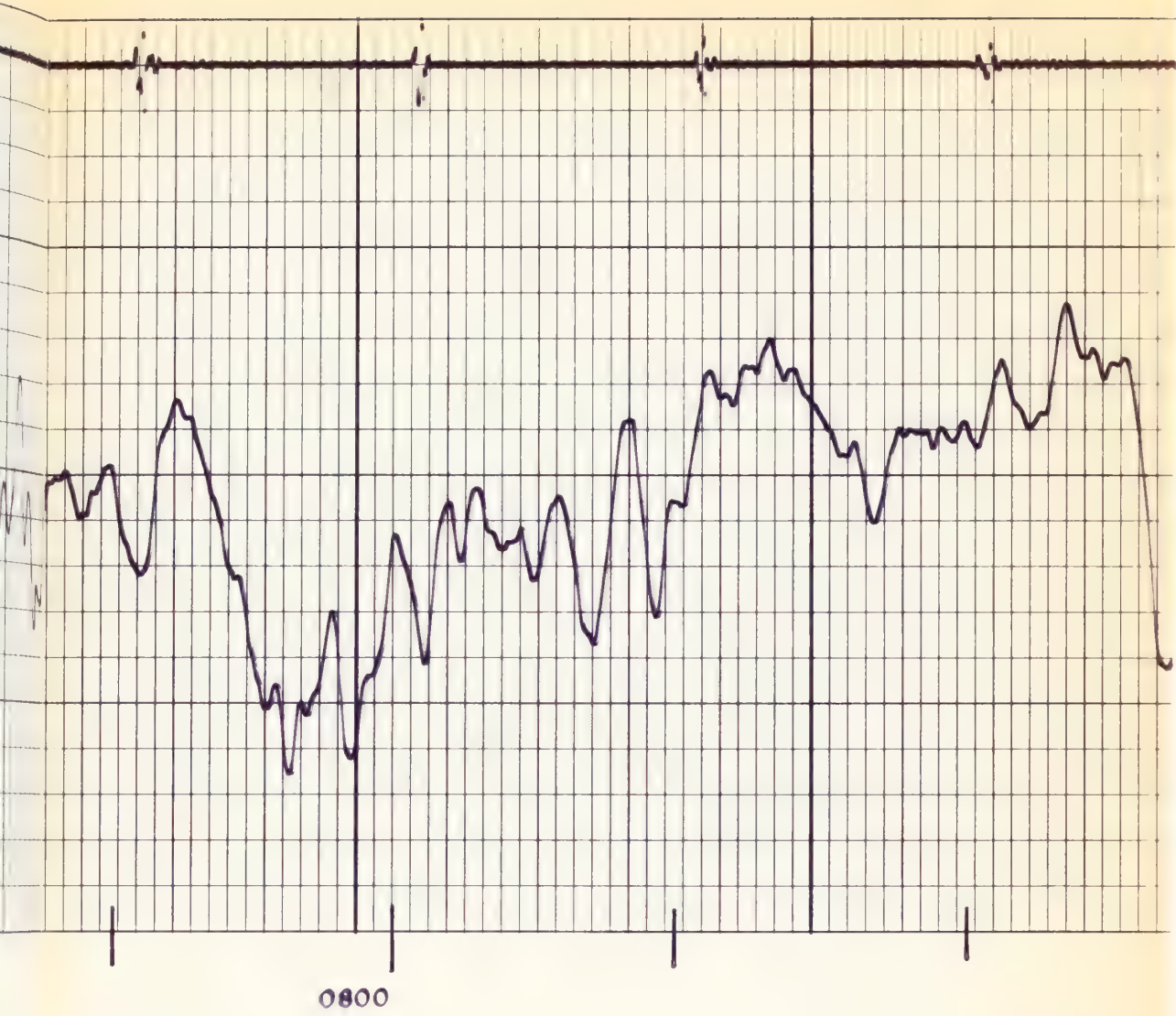


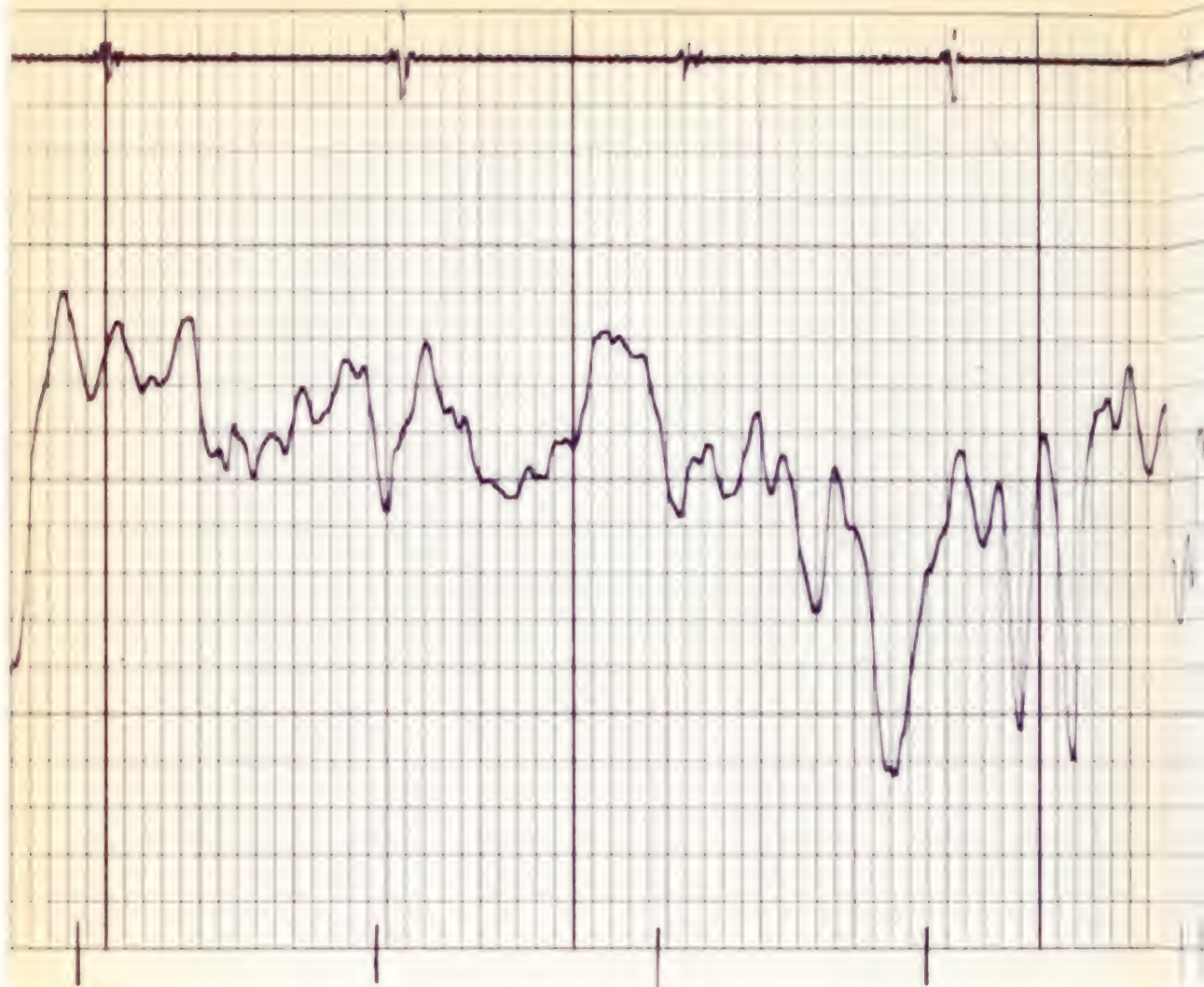




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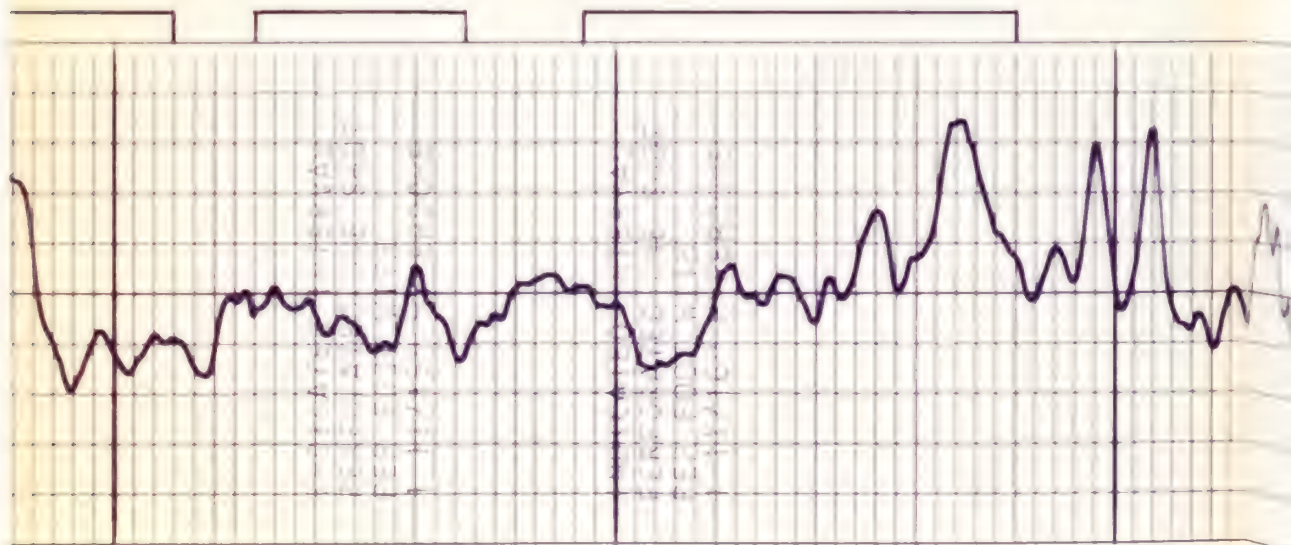


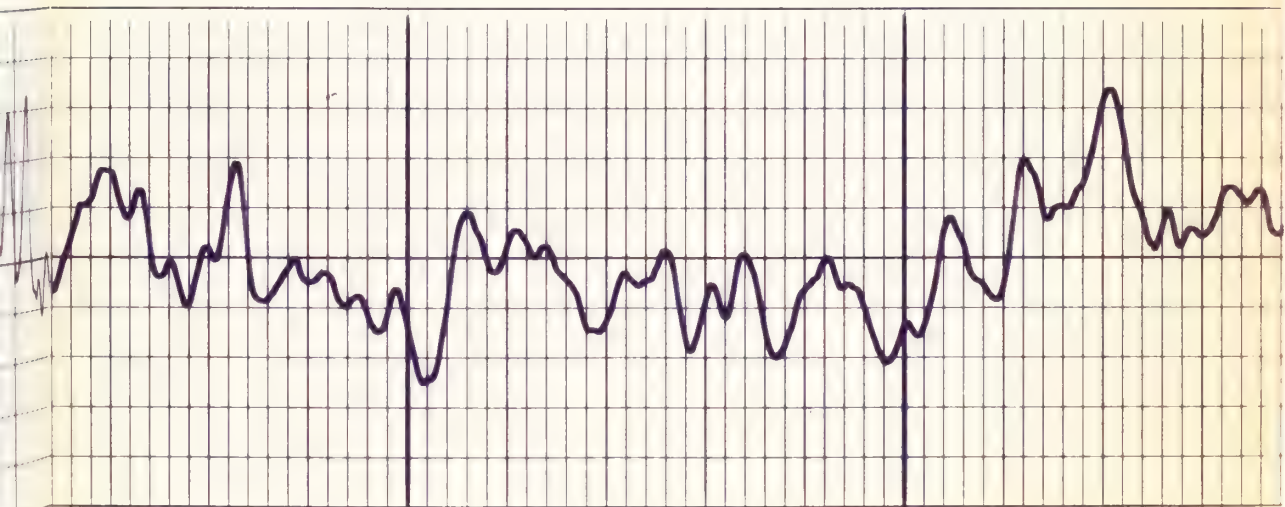
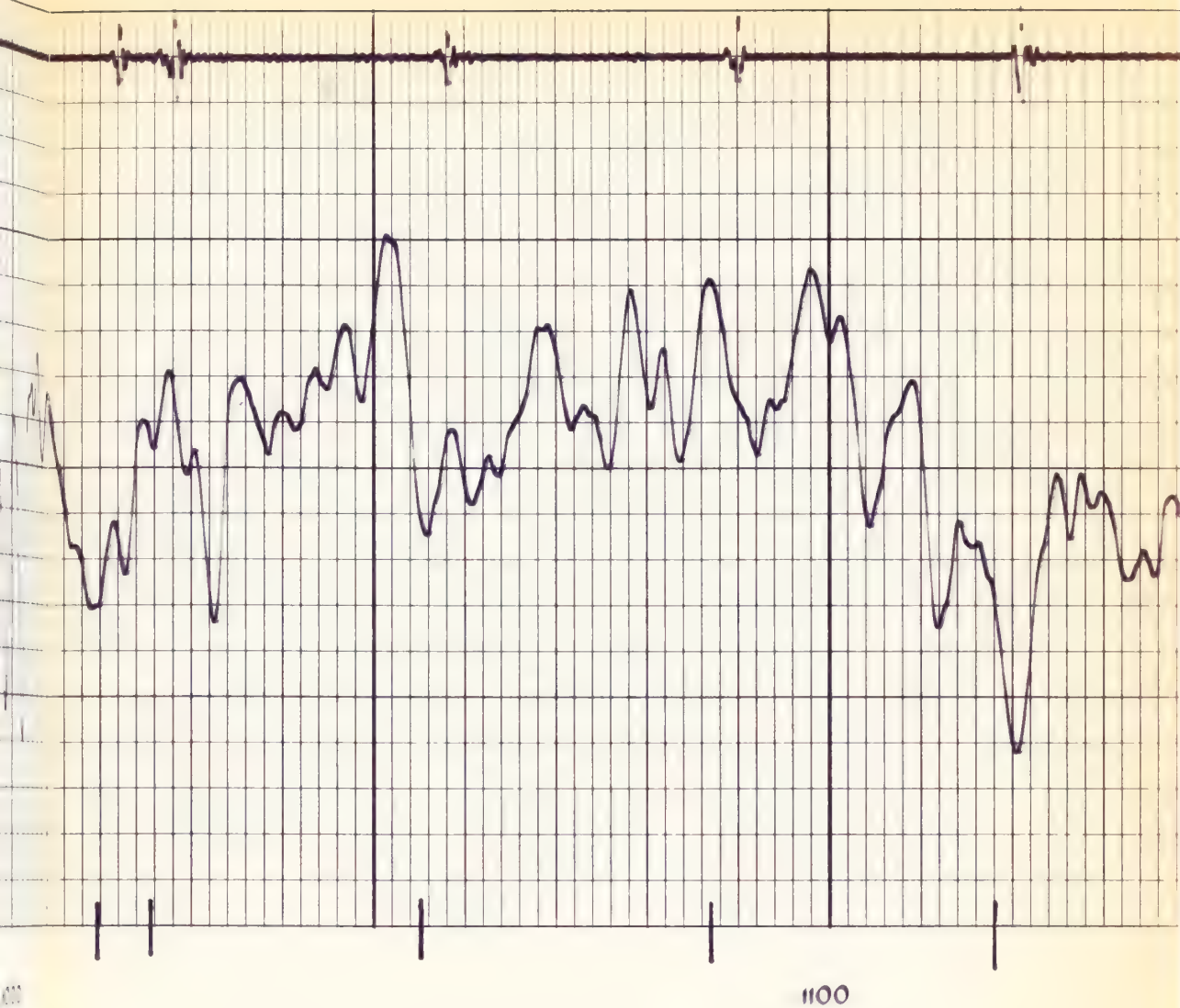


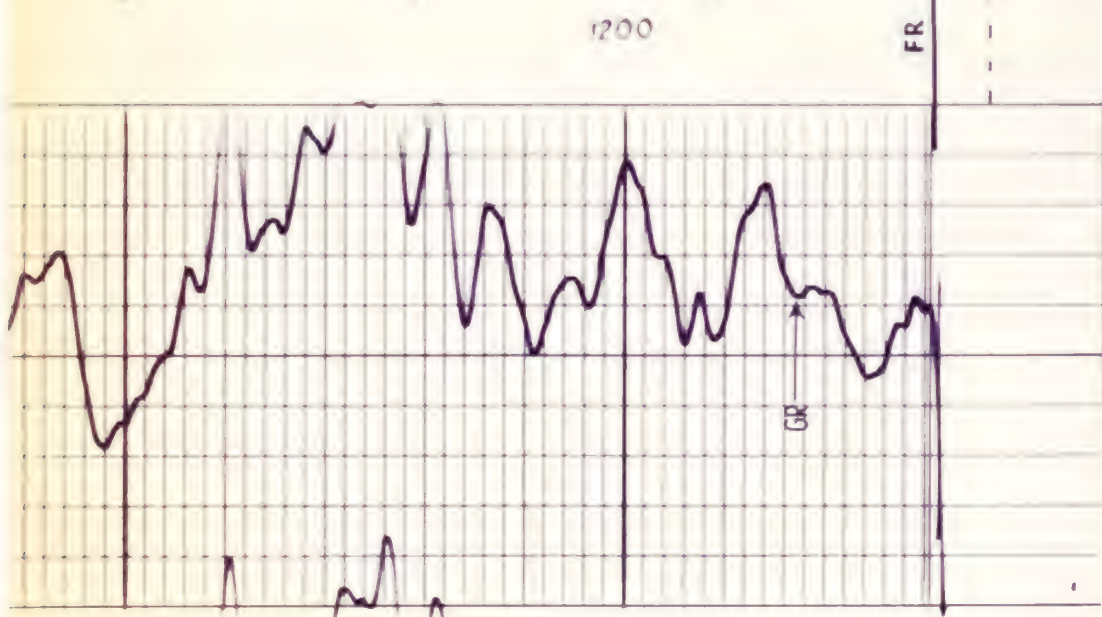
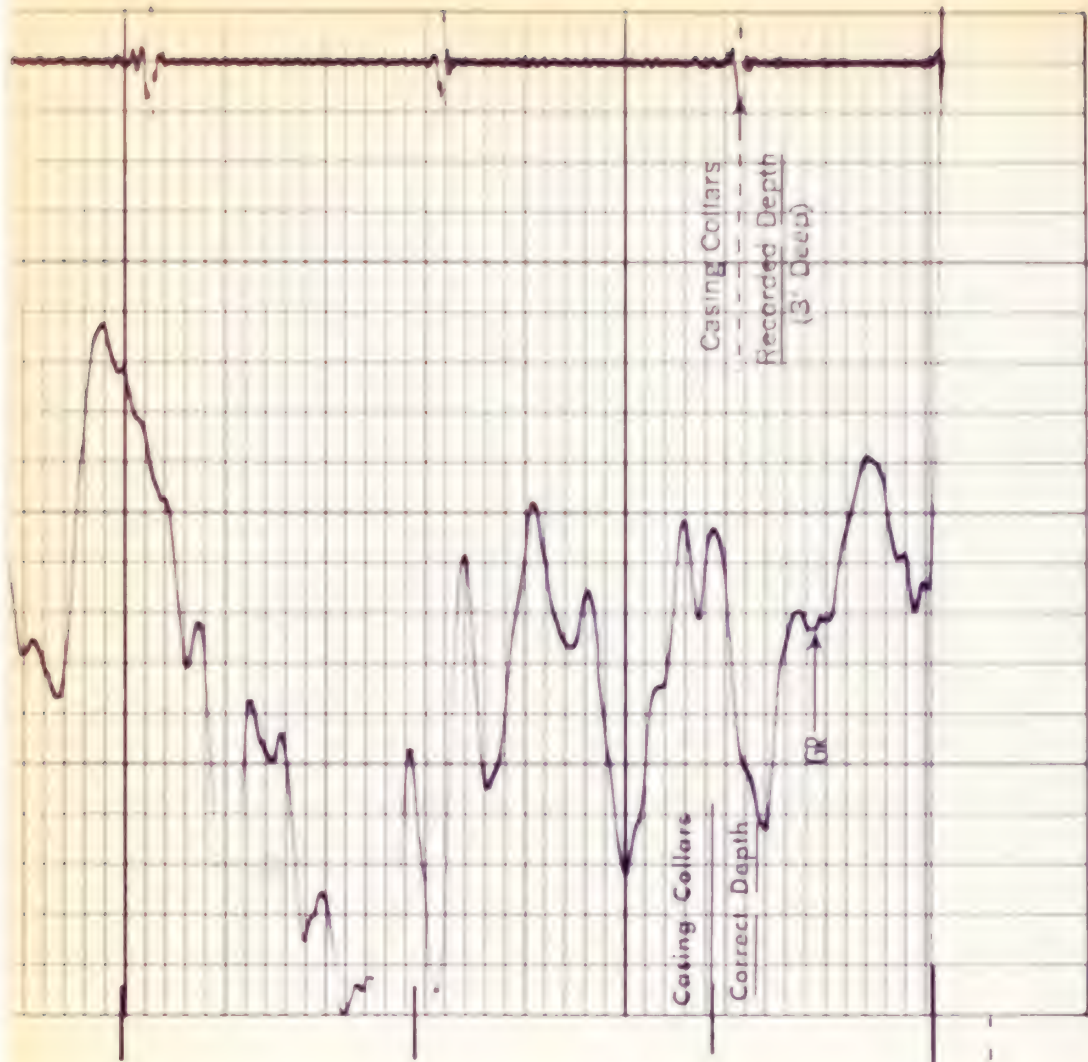


0900

1000







Recorded
Corrected

GAMMA RAY

Casing Collars
Correct Depth

GAMMA RAY

GAMMA RAY

RADIOACTIVITY INCREASES

GAMMA RAY

RADIOACTIVITY INCREASES

DEPTHS

COMPANY

[illegible]

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119.1

FIELD

11

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- **Customer Time**
- **Logistical**
- **Ordering System**

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|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

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Schlumberger**ORIENTED PERFORATING RECORD
AND CASING COLLAR LOG**

| | | |
|--|--|--------------------------------------|
| COUNTY <u>RIO BLANCO</u> FIELD or LOCATION <u>SORGHUM GULCH</u> WELL <u>S.G. NO. 1</u> COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | |
| | WELL <u>S.G. NO. 1</u> | |
| | FIELD <u>SORGHUM GULCH</u> | |
| | COUNTY <u>RIO BLANCO</u> STATE <u>COLORADO</u> | |
| Location: <u>1946' FEL &</u> <u>1314' FSL</u> | | Other Services: CBL-VDL PDC-GR |
| Sec. <u>2</u> Twp. <u>3S</u> Rge. <u>97W</u> | | |

Permanent Datum: GROUND LEVEL; Elev.: 6428
Log Measured From GL, 0 Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 6428

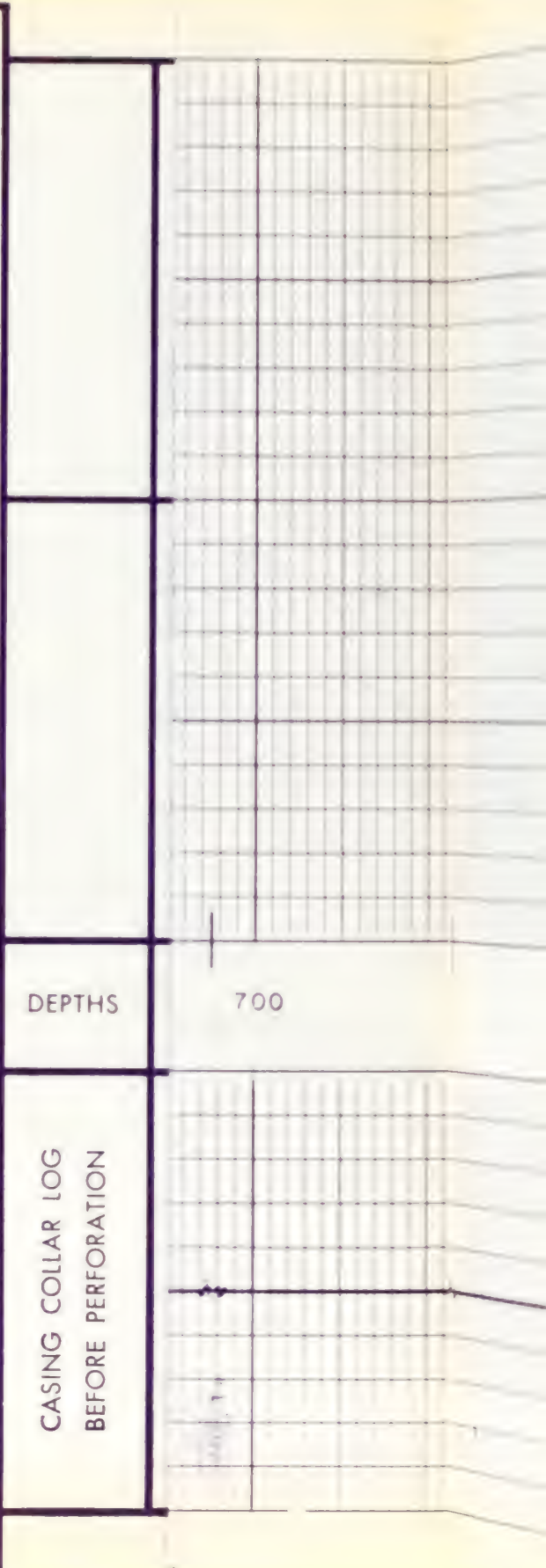
| | |
|------------------------|--------------|
| Date | |
| Run No. | ONE |
| Pipe String No. | ONE/TWO |
| Pipe String Ident. | LONG/SHORT |
| Type Orienting | POWERED |
| | |
| Type fluid in hole | WATER |
| Salinity, PPM Cl. | ---- |
| Density | ---- |
| Level | FULL |
| Max rec. temp., deg F. | ---- |
| Operating rig time | 76 HOURS |
| Recorded by | ST.AUBYN |
| Witnessed by | MR. DON TAIT |
| | |

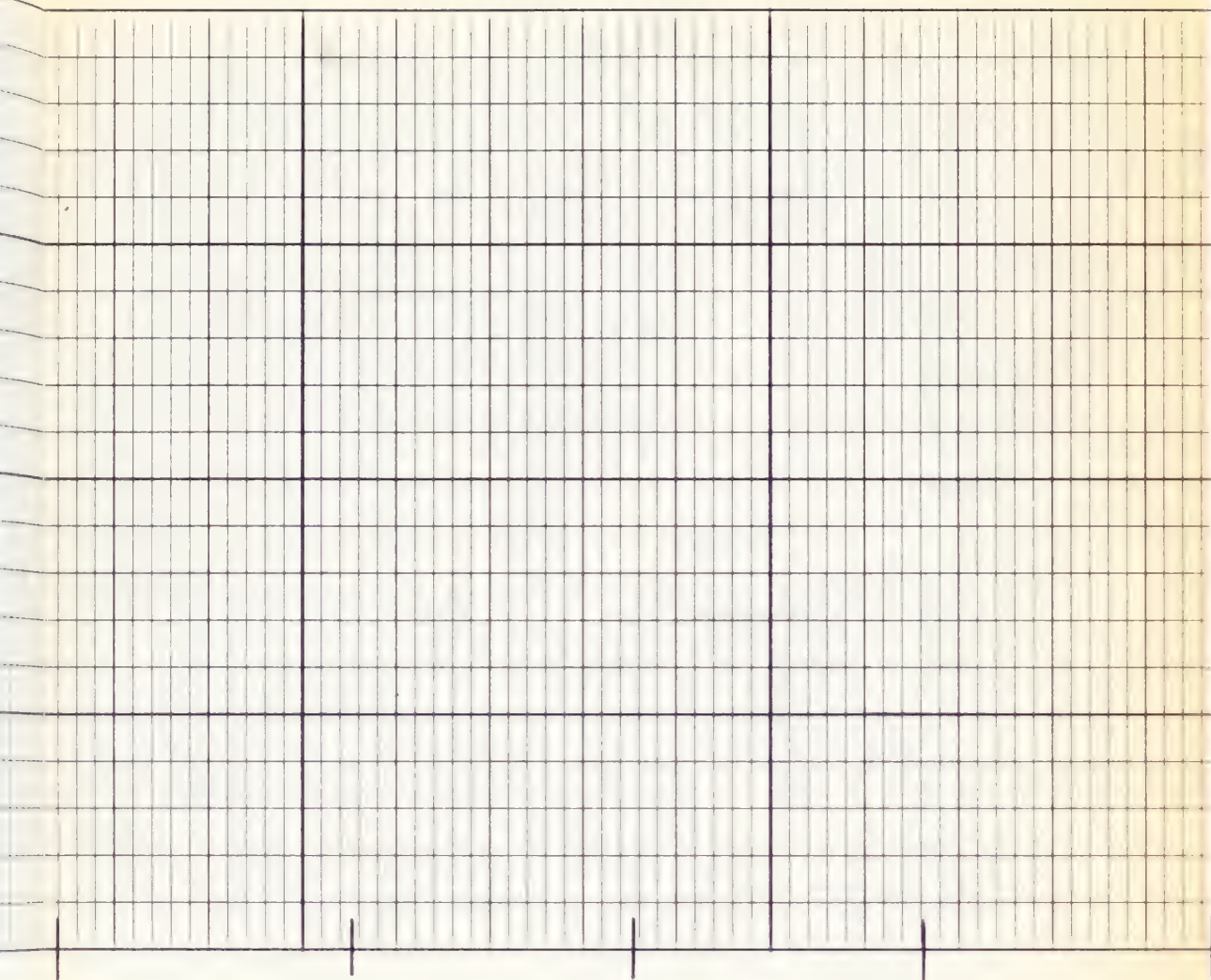
| BORE-HOLE RECORD | | | CEMENTING RECORD | | | | |
|------------------|------|------|------------------|-------|------|------|------|
| Bit | From | To | | Type | Wgt. | From | To |
| 6 3/4 | 154 | 2540 | Primary | "G" | | 1400 | 2519 |
| | | | Squeeze | THEK0 | | 896 | 1400 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

FIELD NO. THE WELL NAME, LOCATION AND BOREHOLE IDENTIFICATION DATA WERE FURNISHED BY THE CUSTOMER

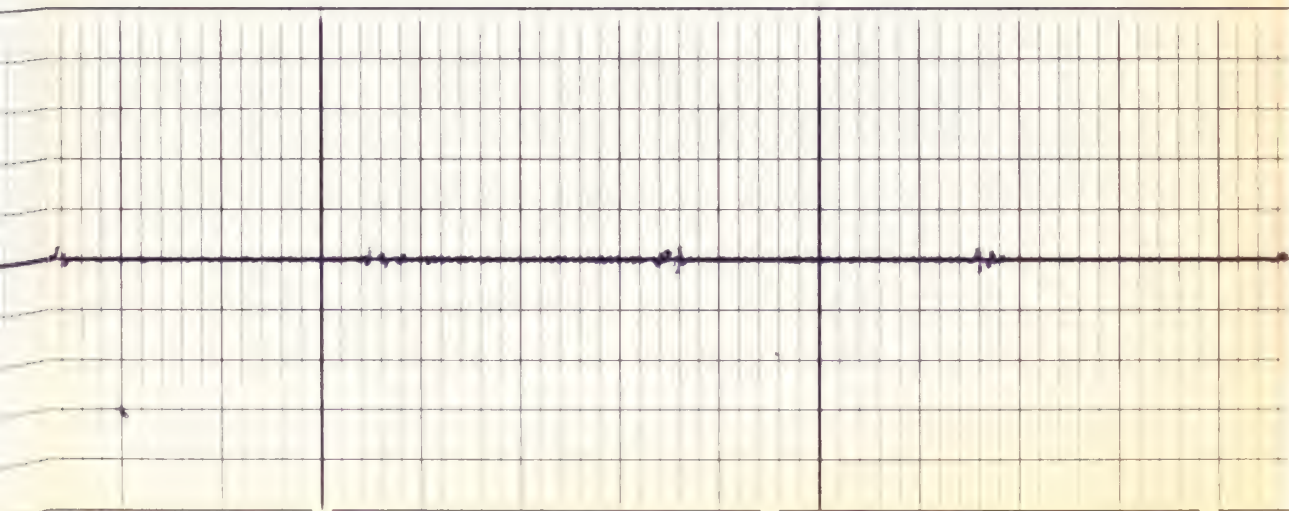
| EQUIPMENT DATA | | | | | DEPTHS RELATE TO | | CASING COLLARS | |
|-----------------------------------|-----------|-----------------------|------------|--------------|------------------|-------|----------------|--|
| Hoist Truck No. | 3862 | Rotator Size | 1 1/2" 16" | | | | | |
| Inst. Truck No. | 3862 | Rotator No. | 40 | | | | | |
| Tool Serial No. | 511 | Indexer Type | POWERED | | | | | |
| Location | VERMILION | Indexer No. | 511 | | | | | |
| PERFORATING DATA | | | | LOGGING DATA | | | | |
| Depths | | No. | Gun | Time | Sens. | Zero | Calib | |
| From | To | Shots | Type | Const | Setting | Shift | Defl | |
| NO. 1 - LONG STRING PERFORATIONS | | WARRIOR ON COLLAR LOG | | | | | | |
| NO. 2 - SHORT STRING PERFORATIONS | | WARRIOR ON COLLAR LOG | | | | | | |
| Remarks: | | | | | | | | |

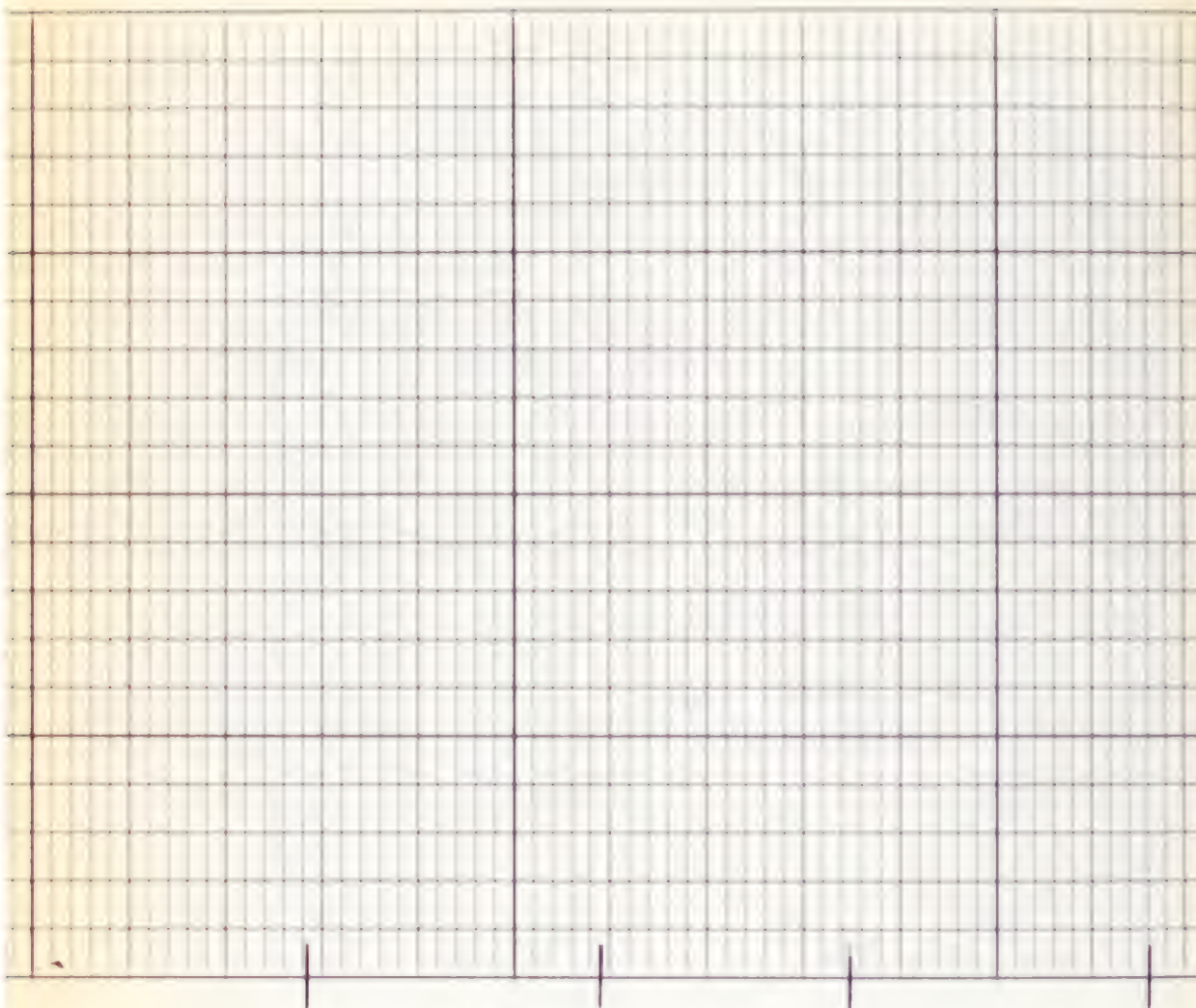
| PIPE STRING RECORD | | | | |
|--------------------|------|--------|-----|-----|
| Number | 1 | 2 | 3 | 4 |
| Identification | 100 | 200 | 300 | 400 |
| Size | 3/8" | 1 1/2" | | |
| Weight | 4.7 | 6.1 | | |
| Depth | 1519 | 1834 | | |



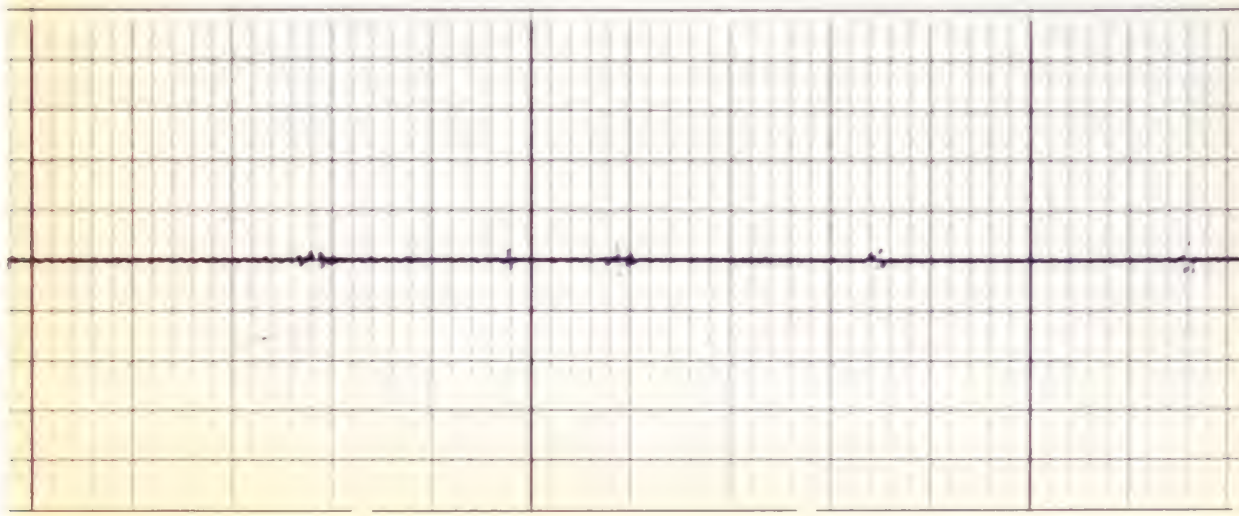


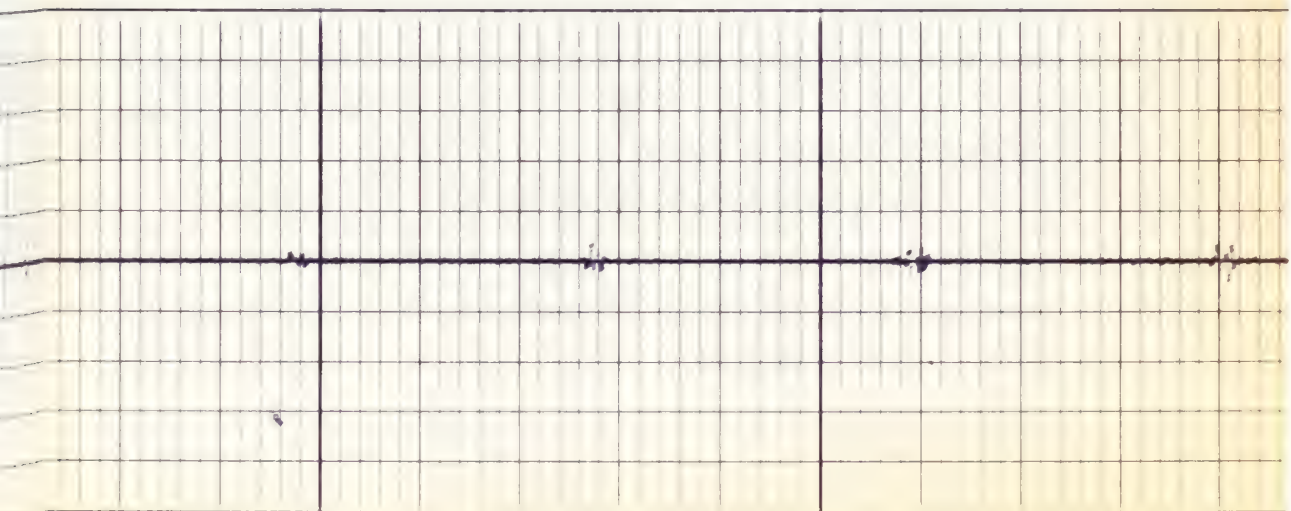
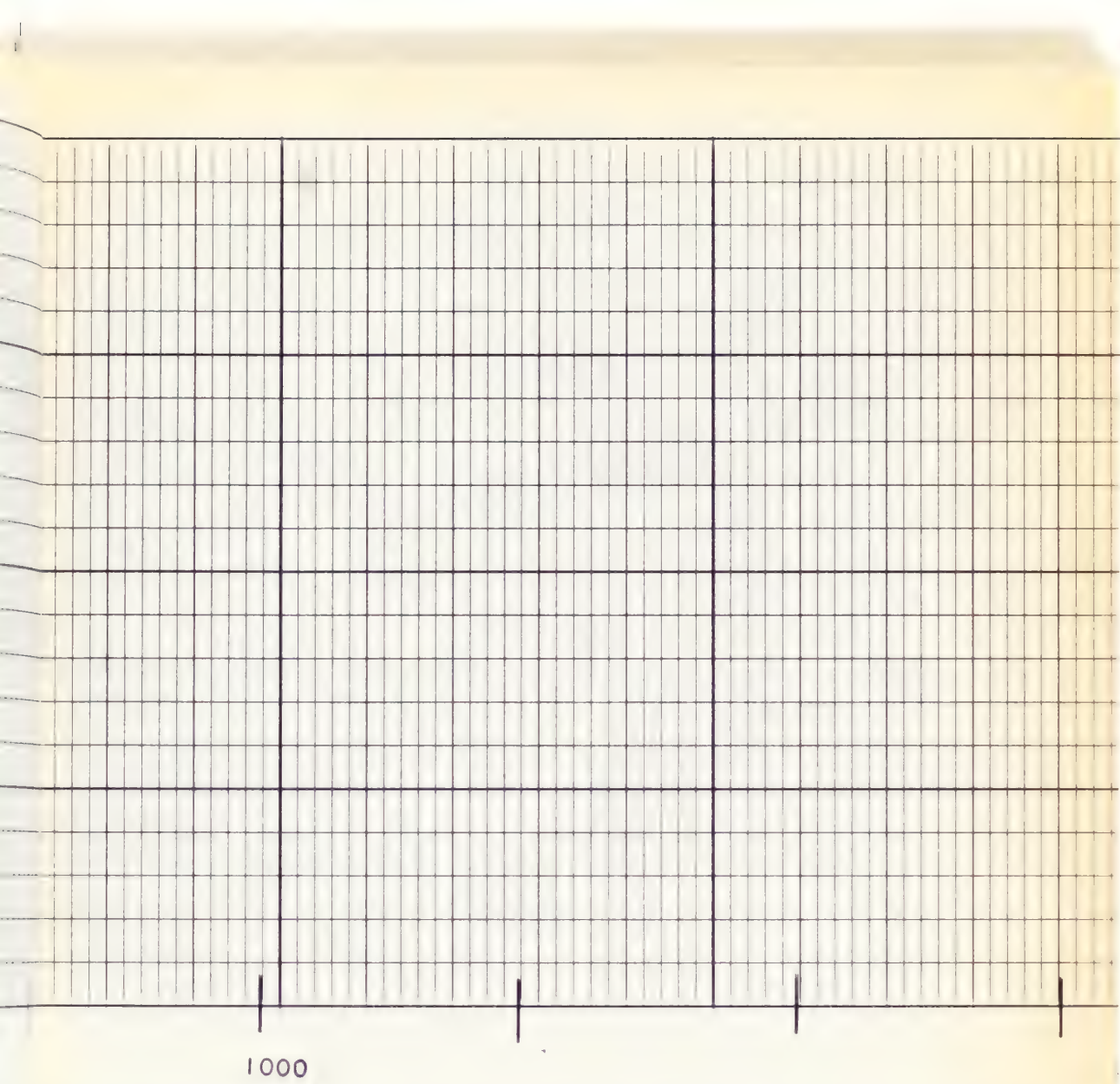
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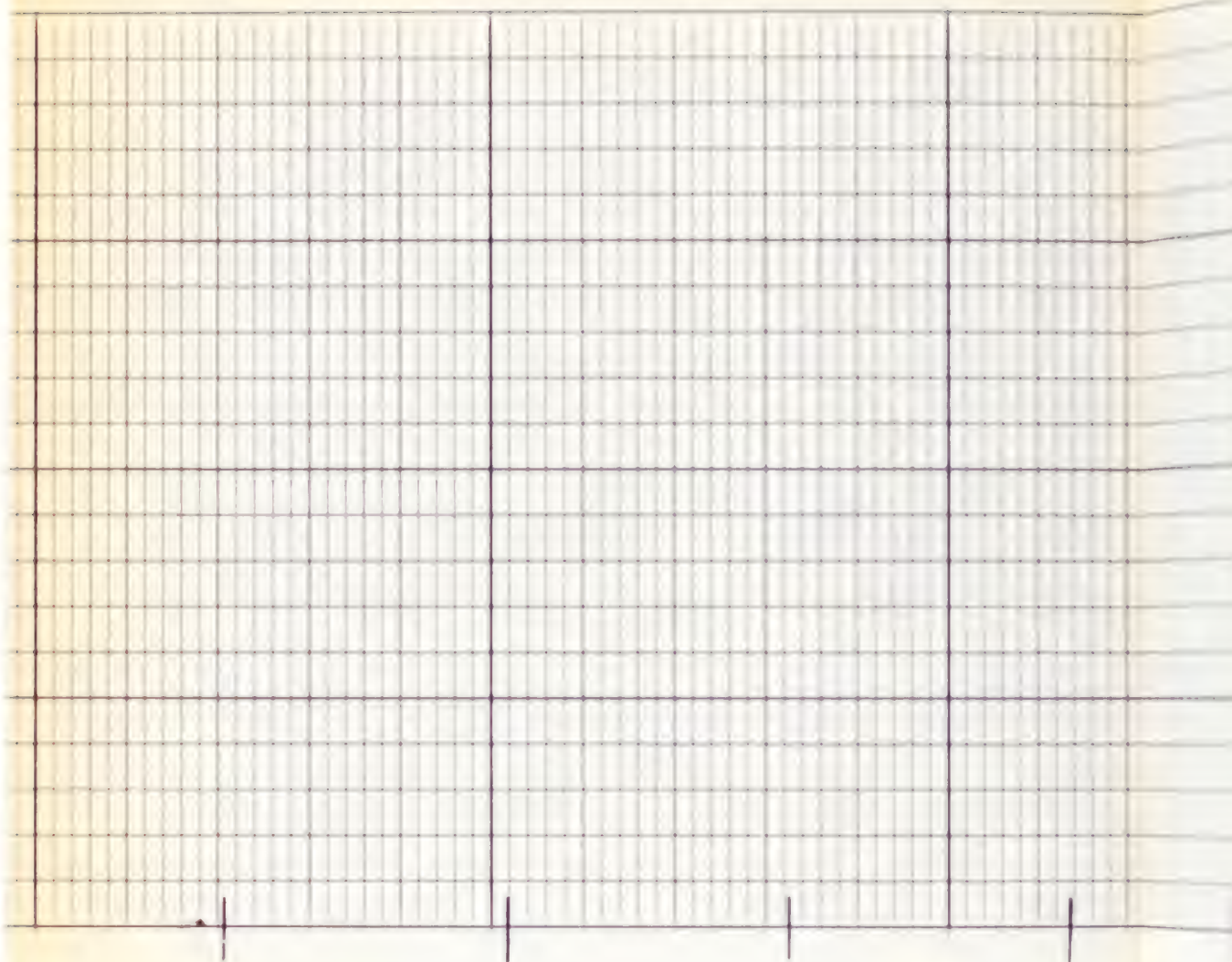




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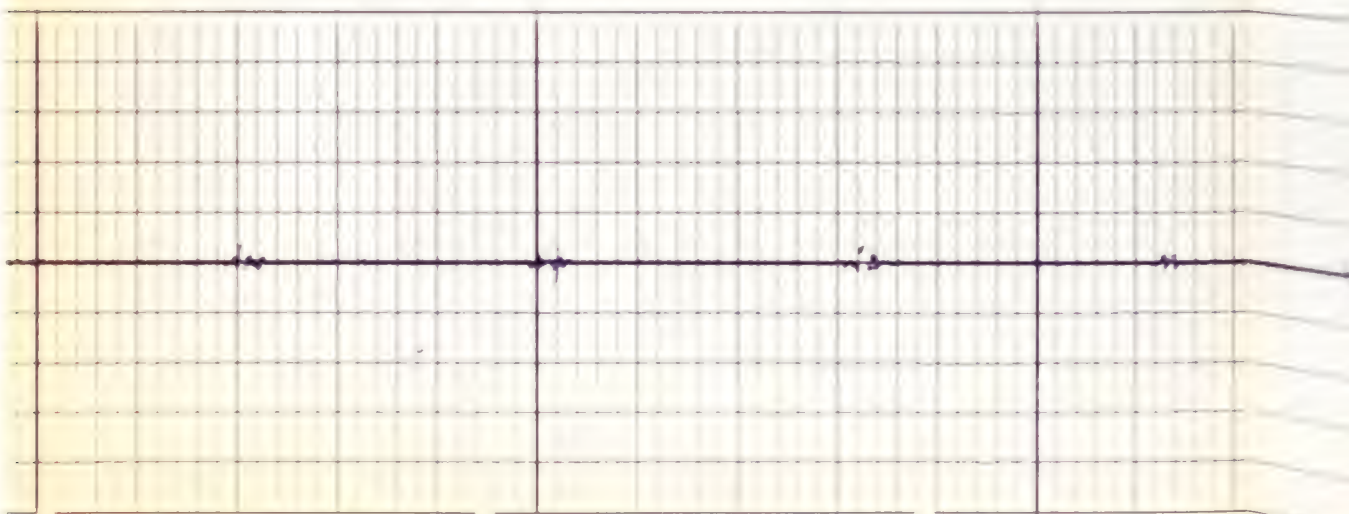


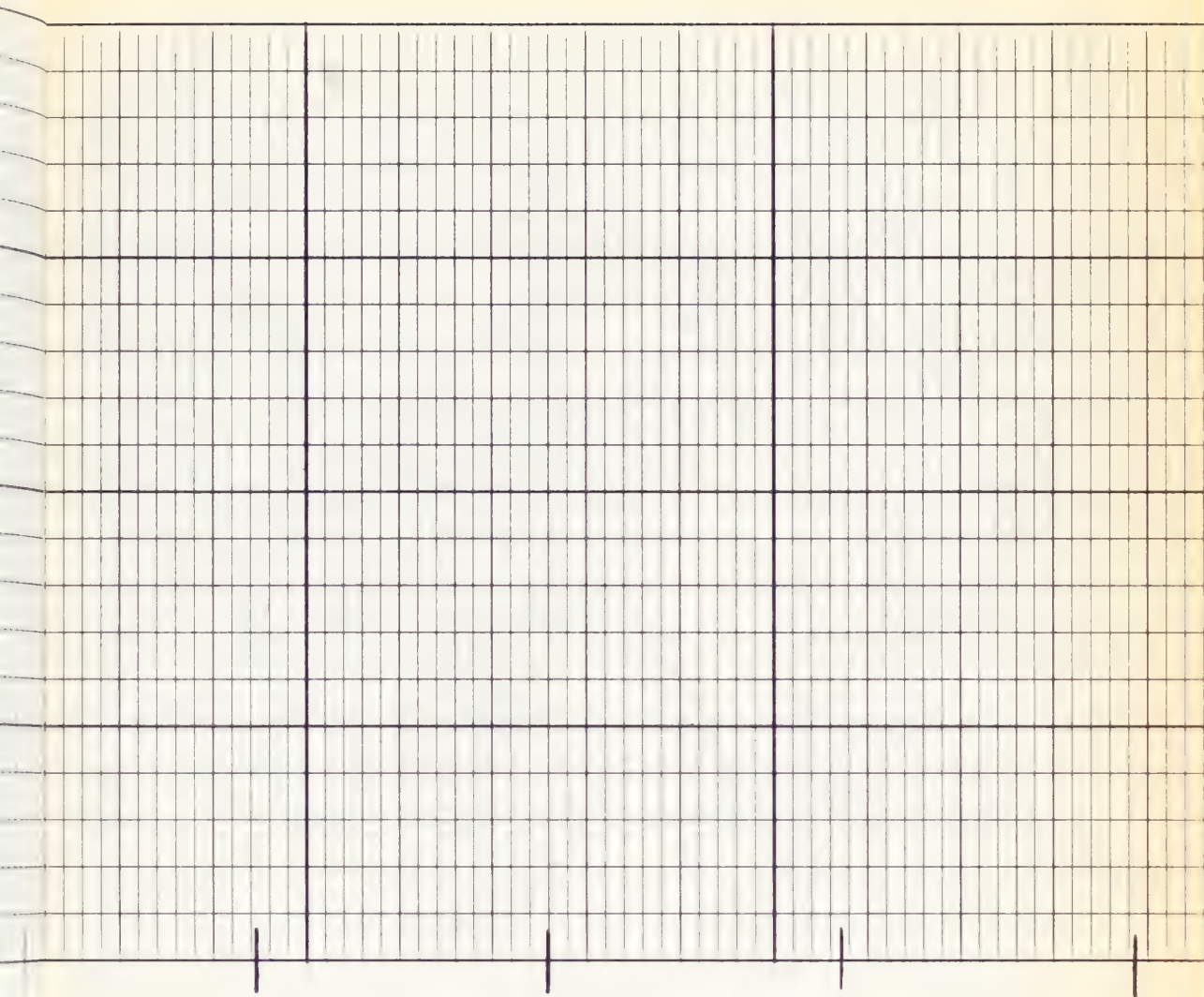




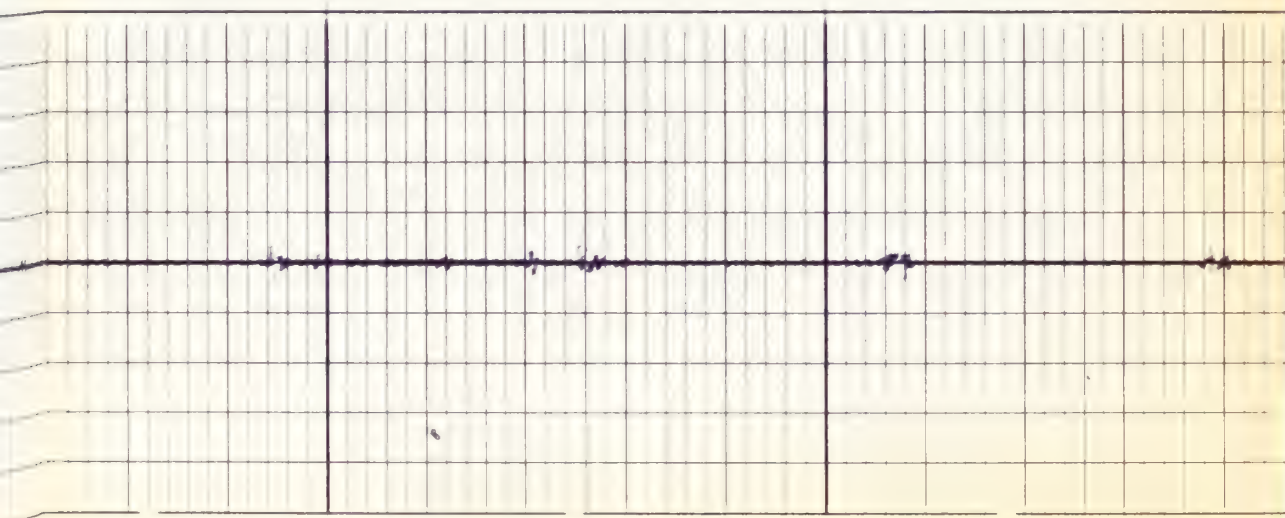
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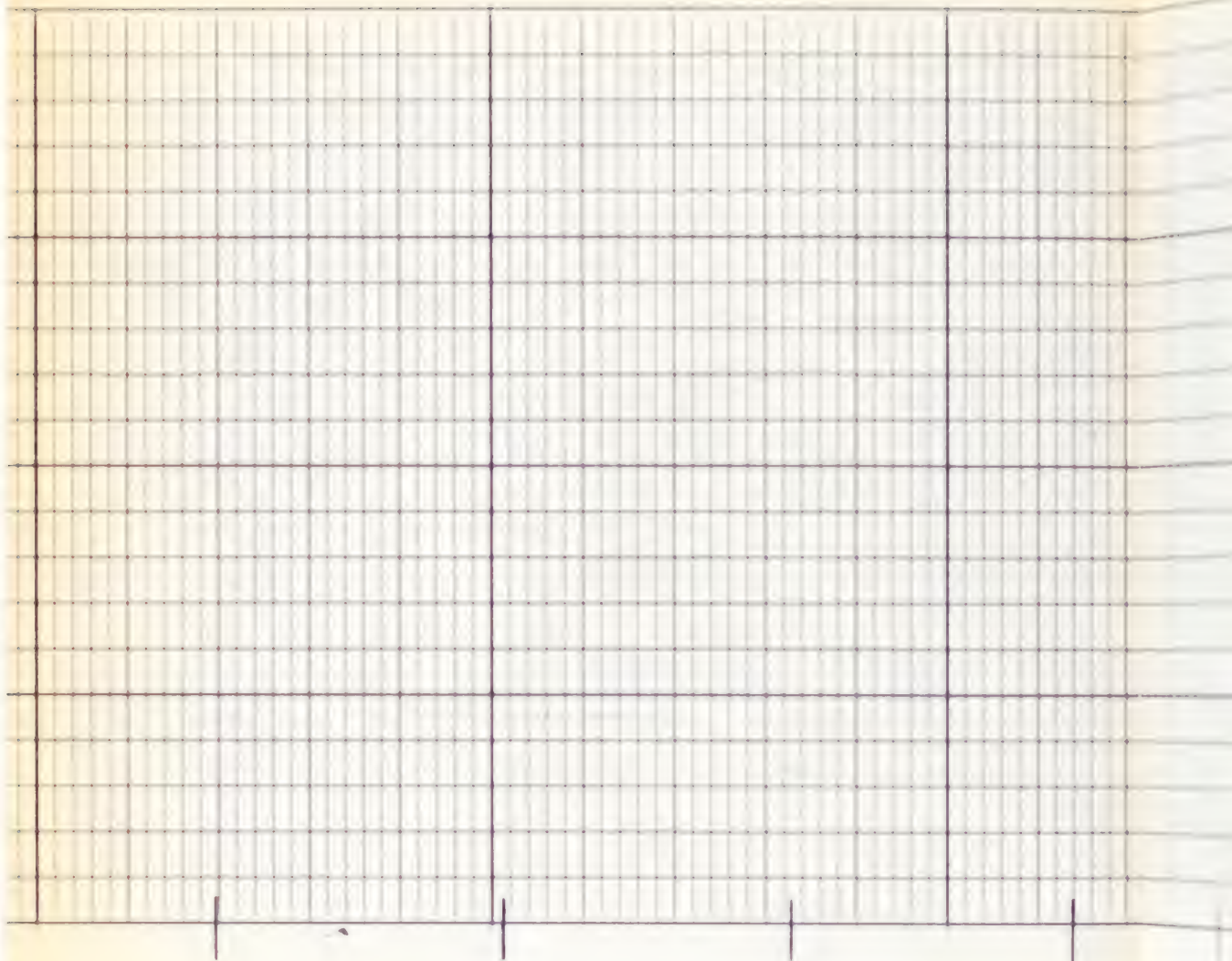
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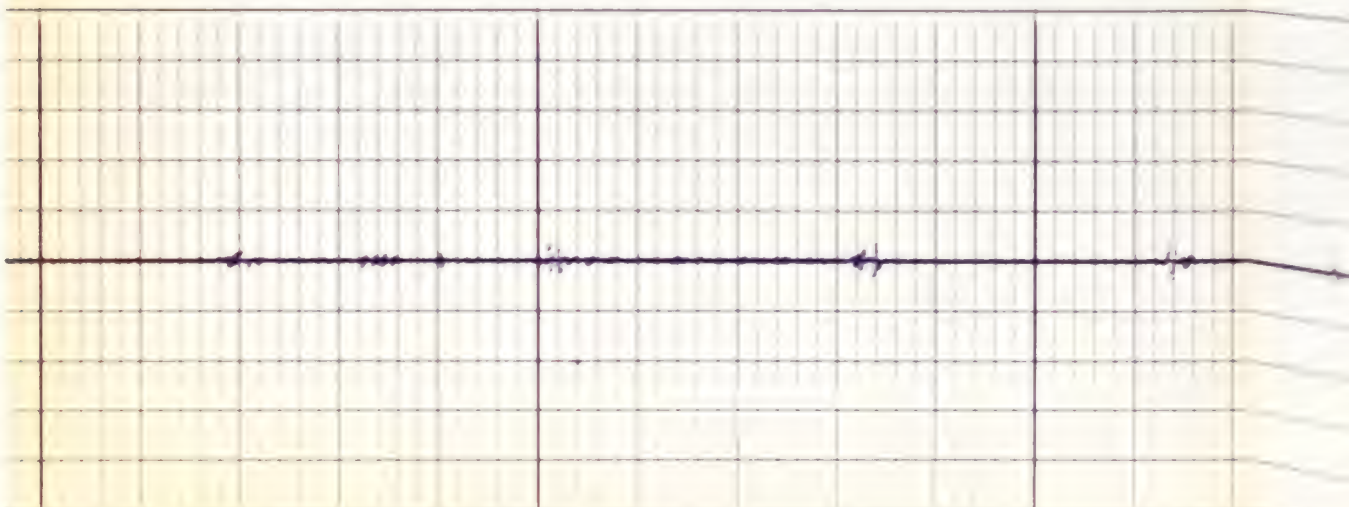


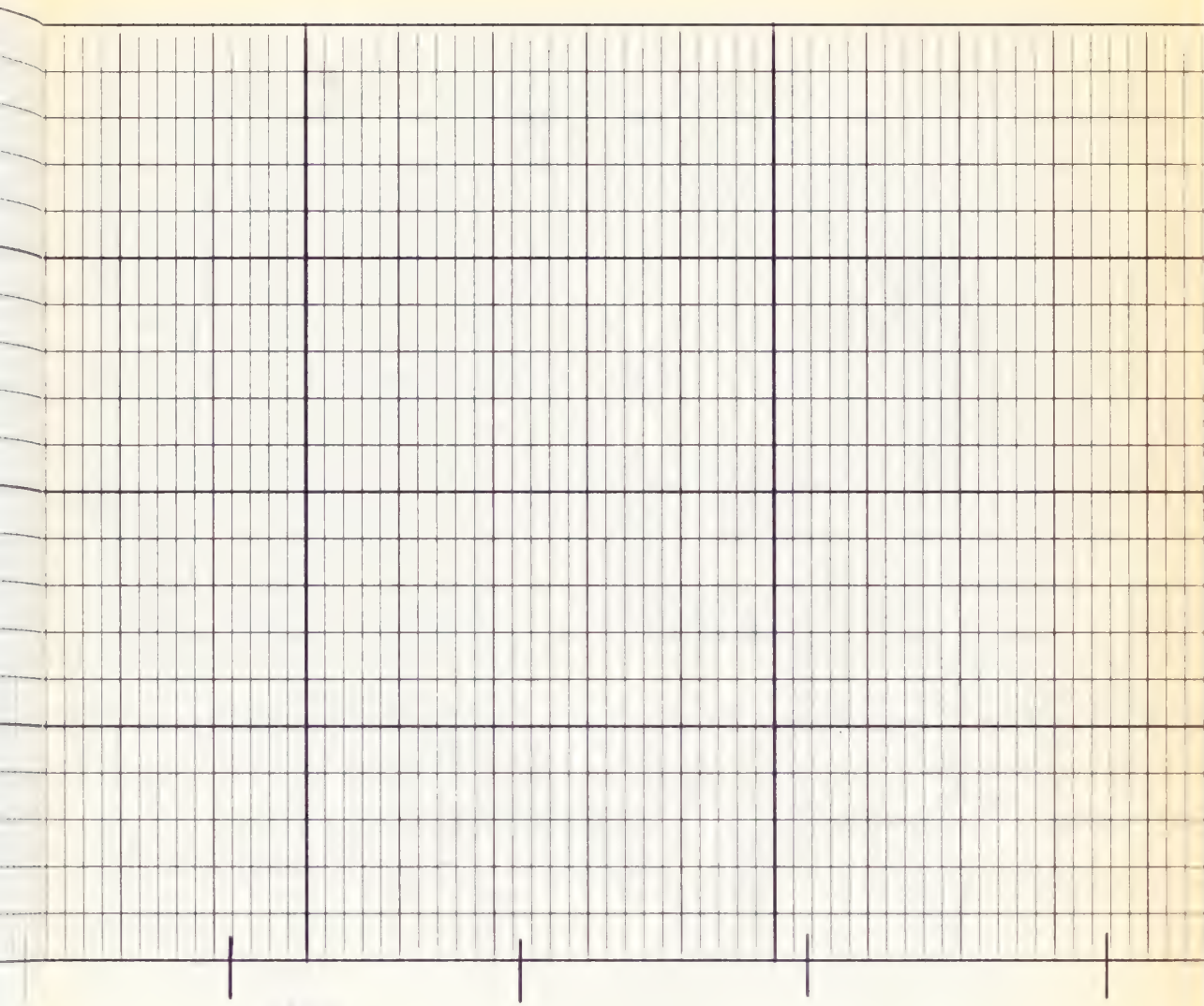
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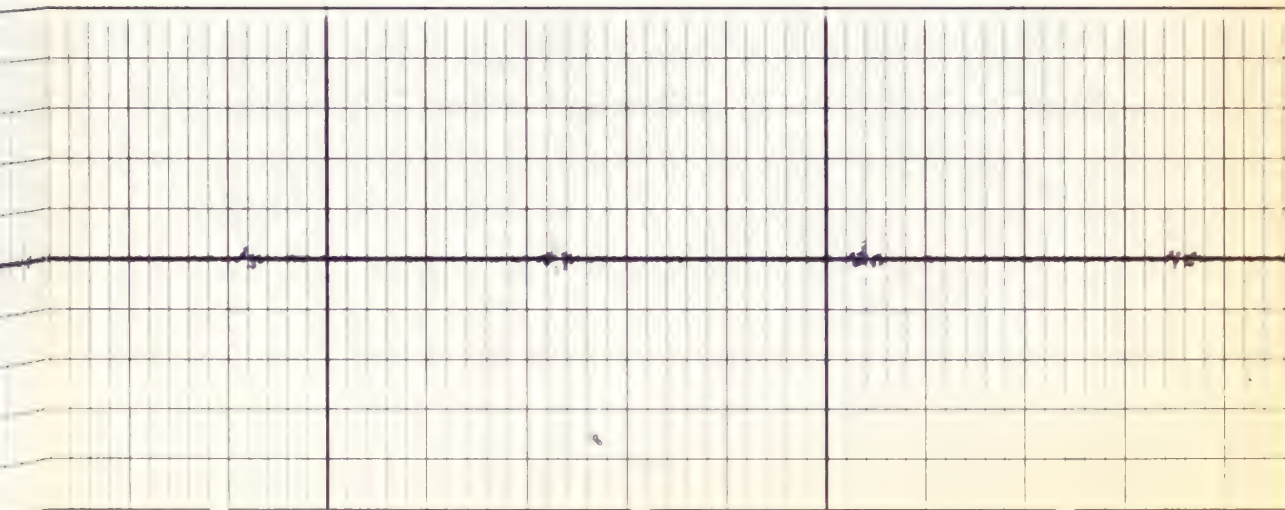


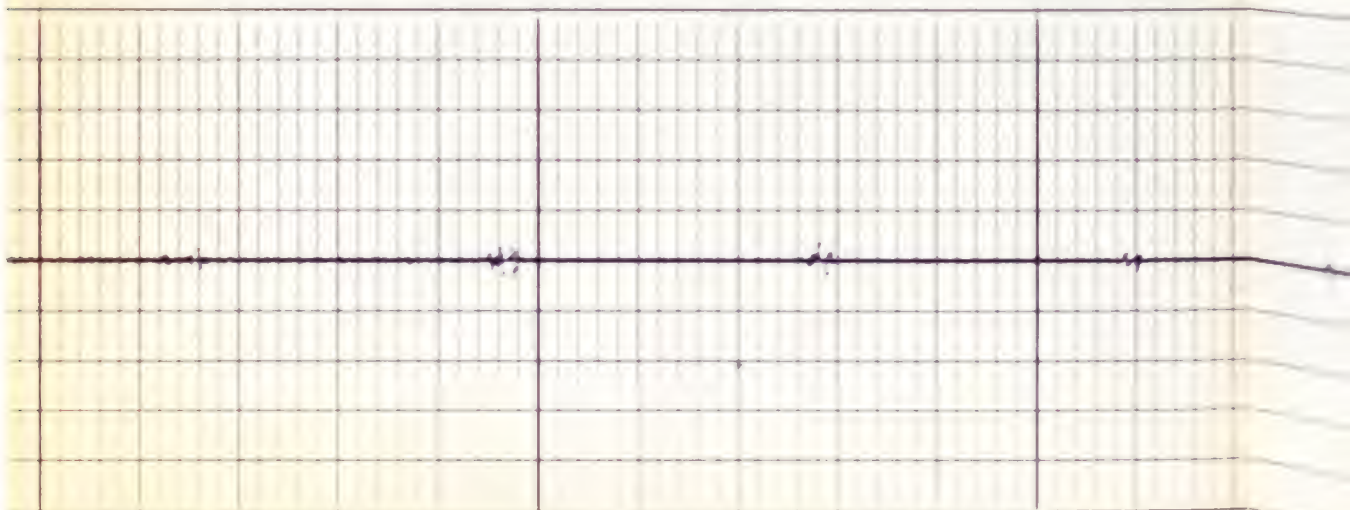
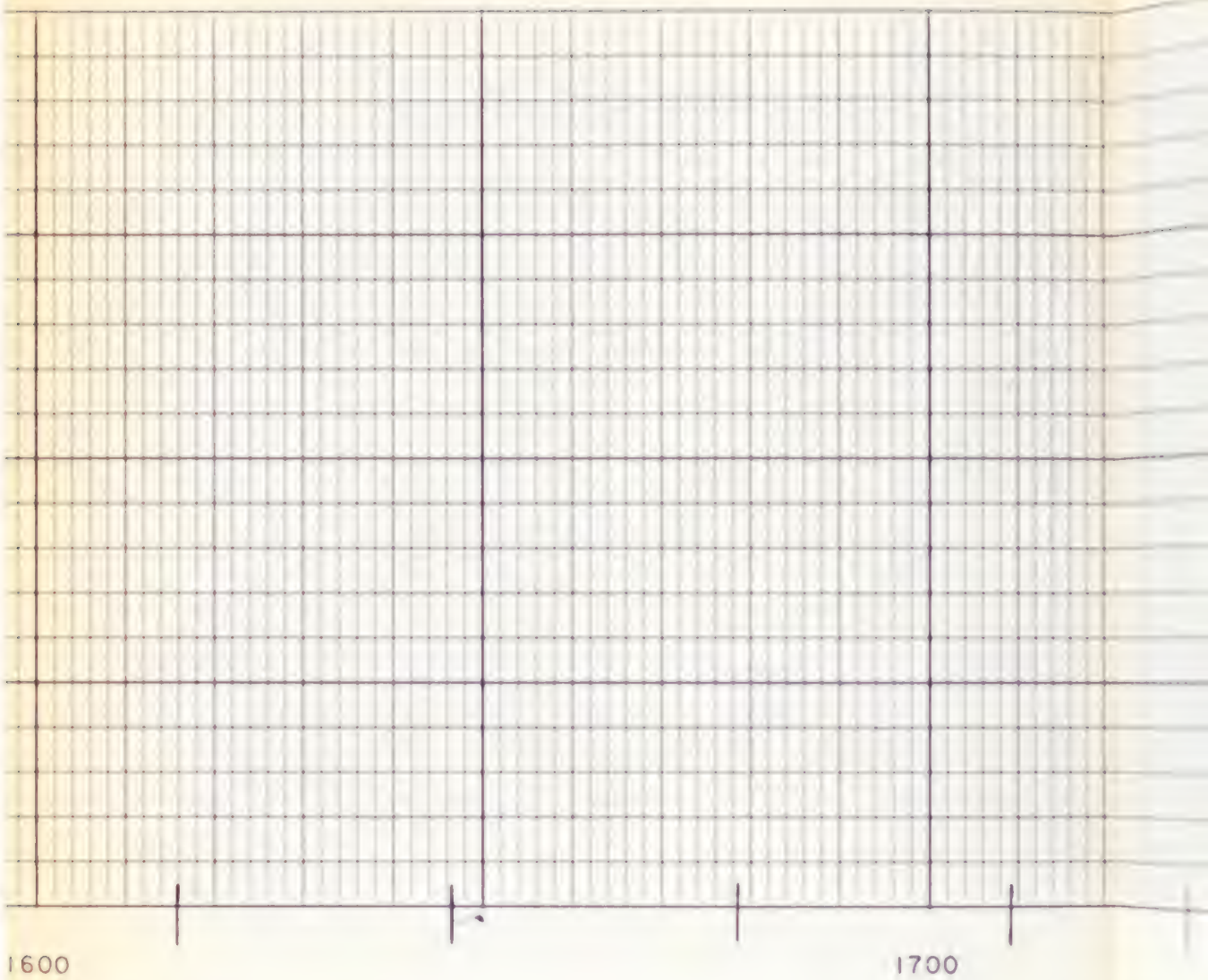
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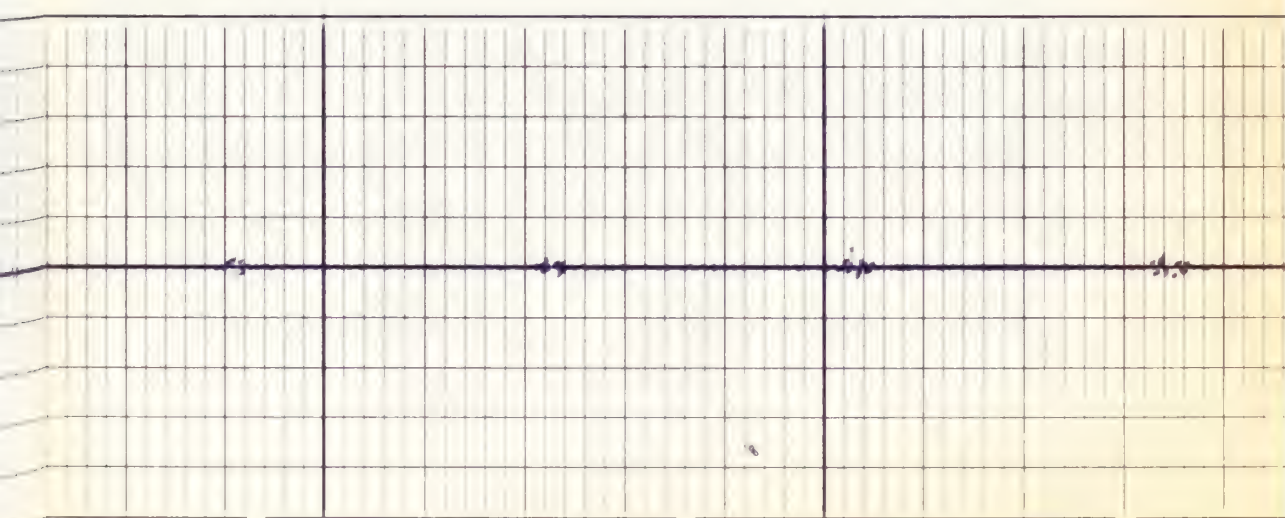
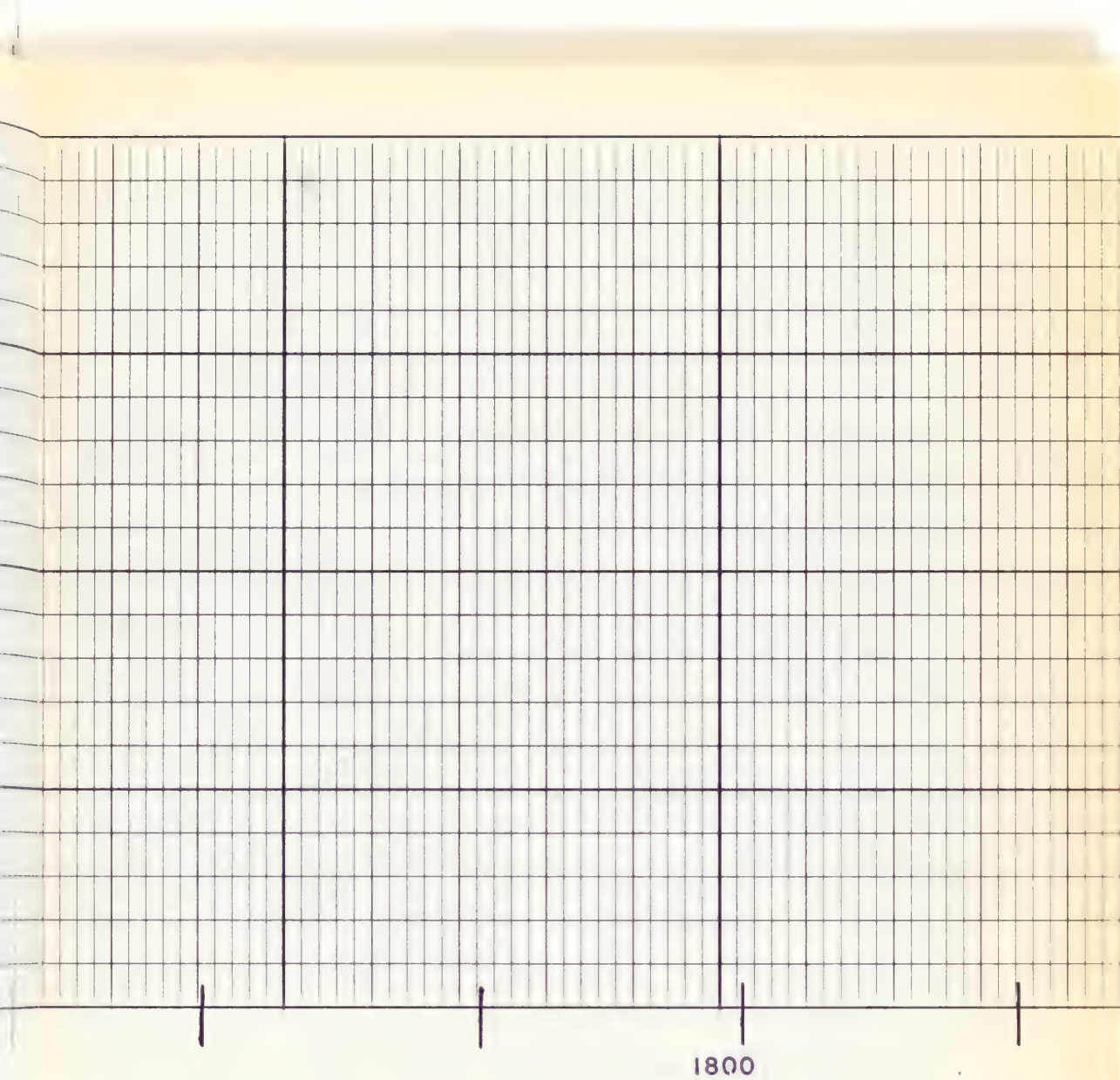


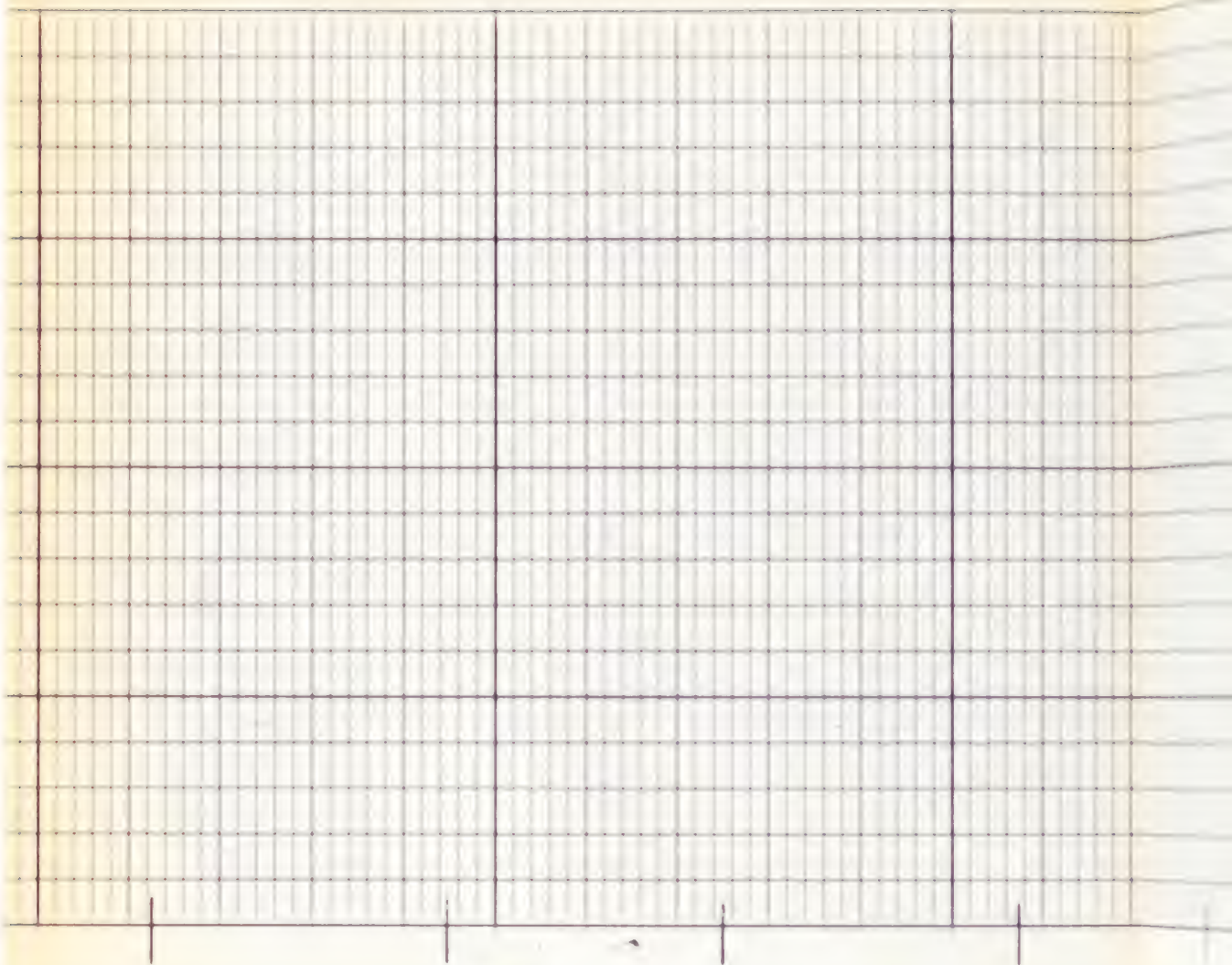


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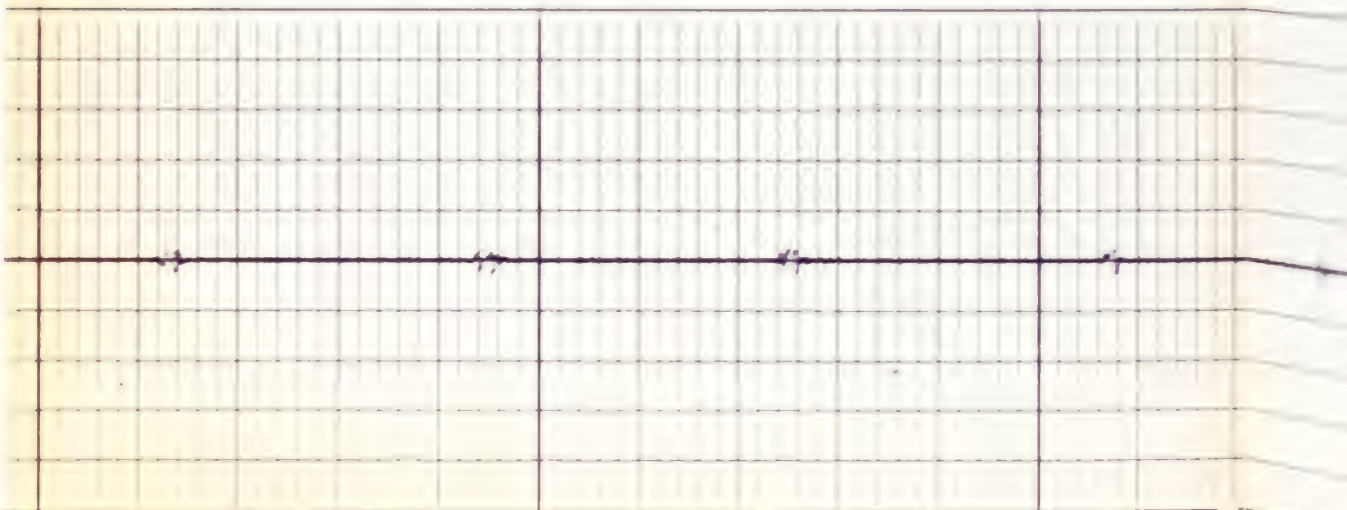


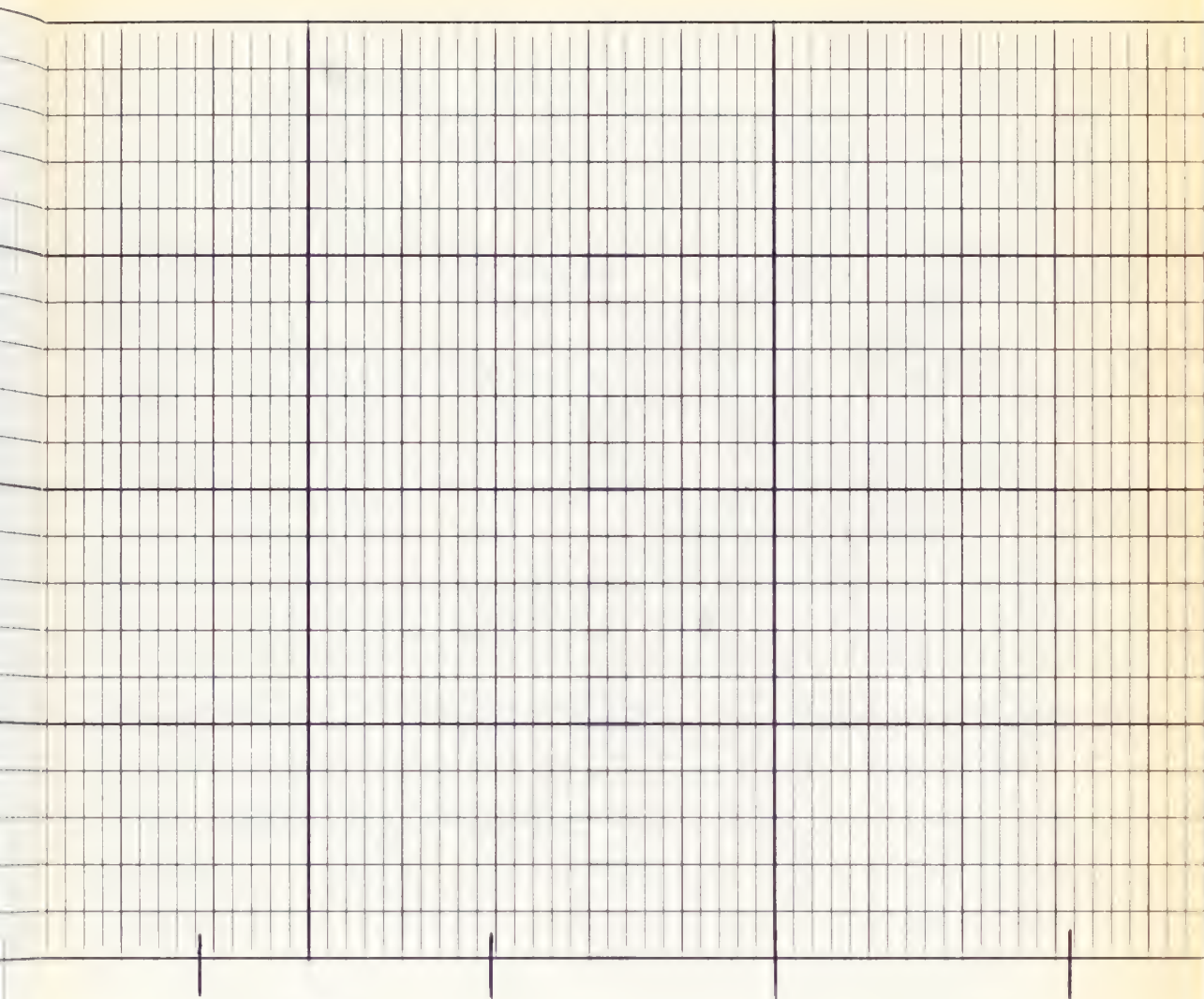




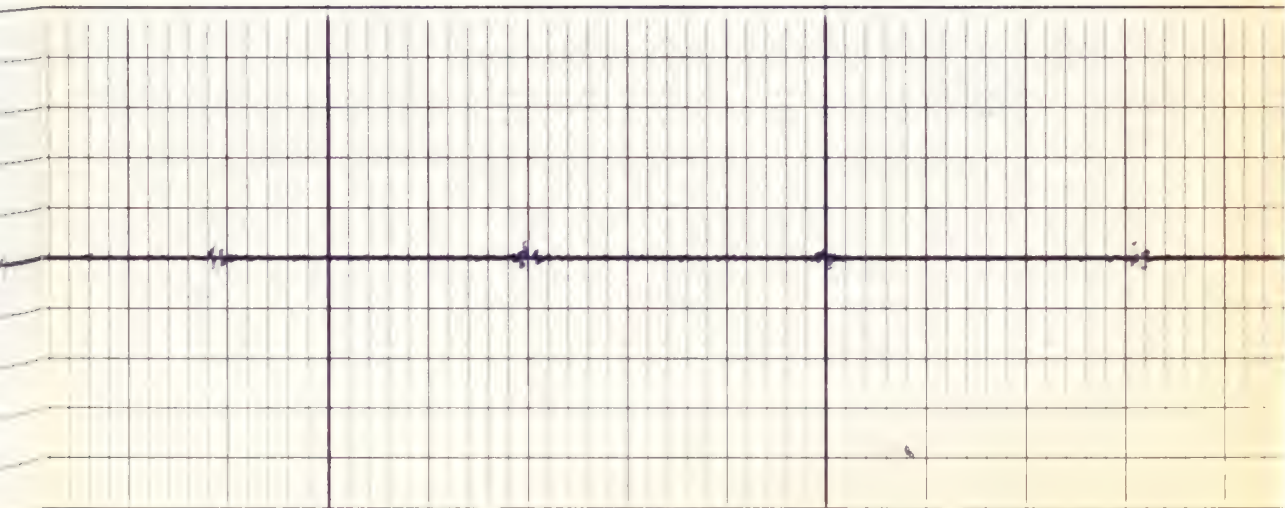


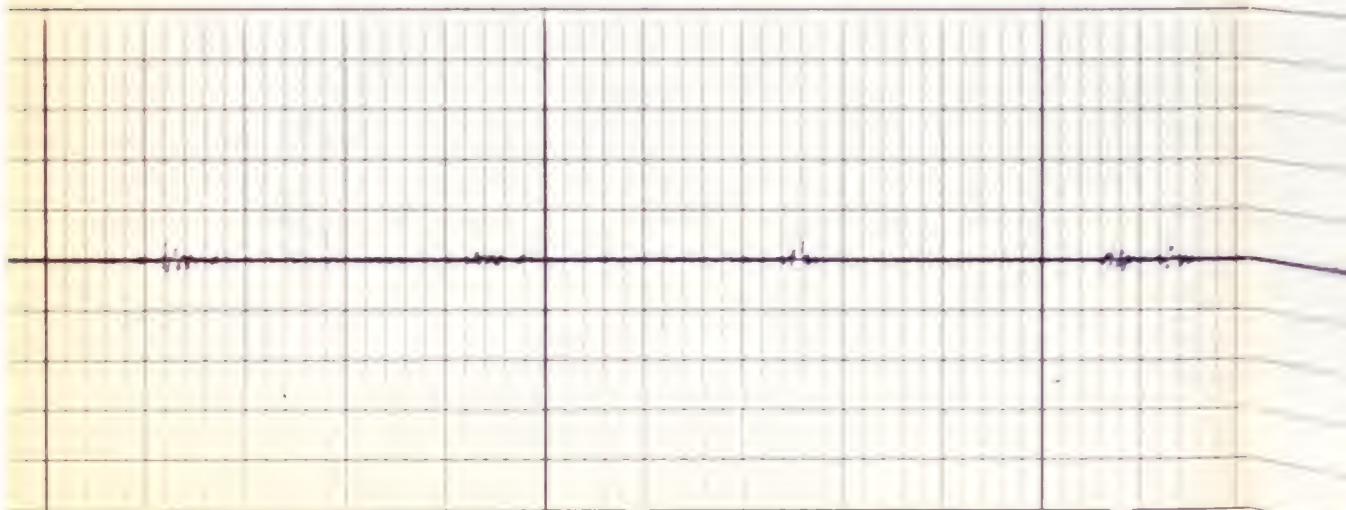
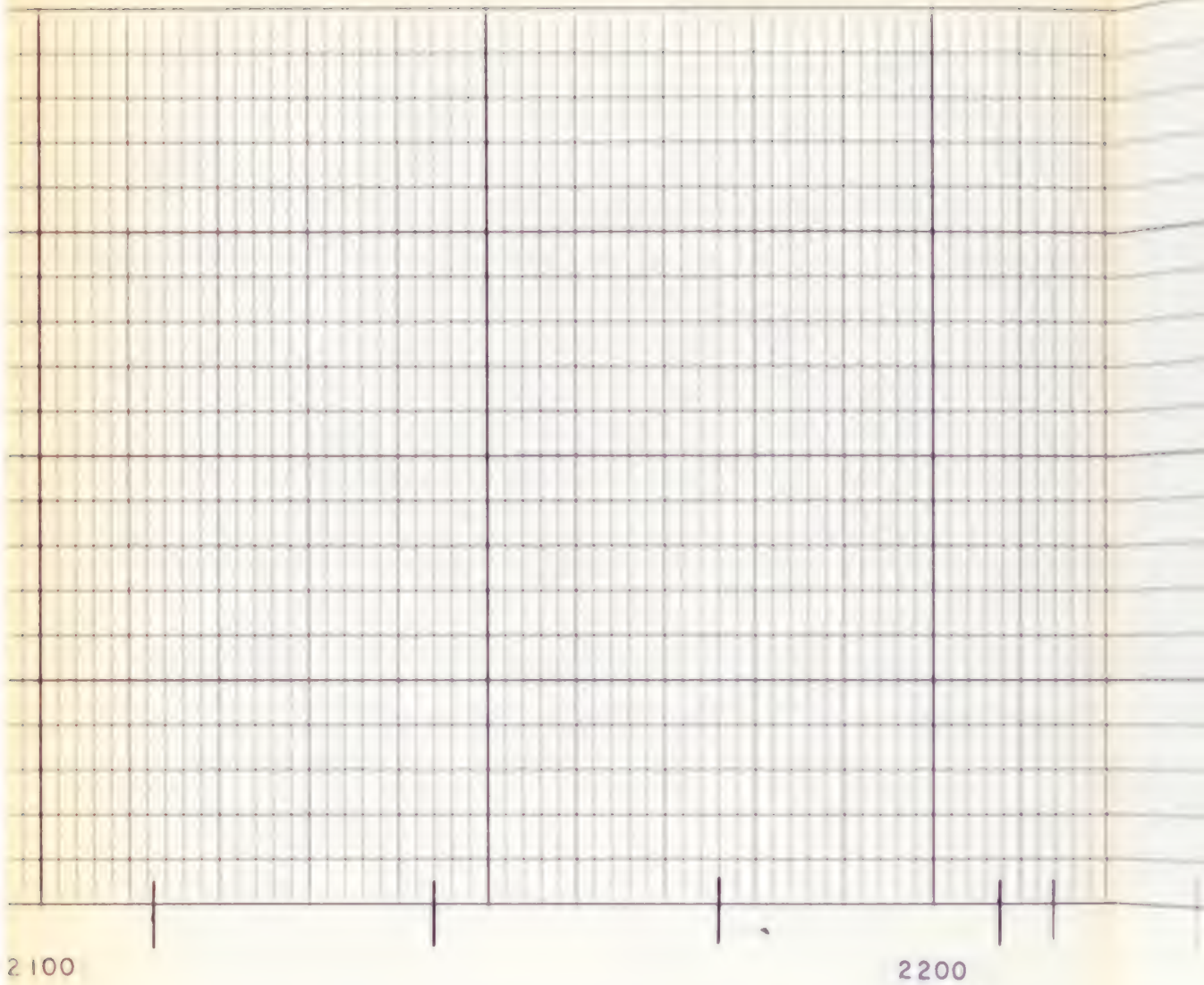
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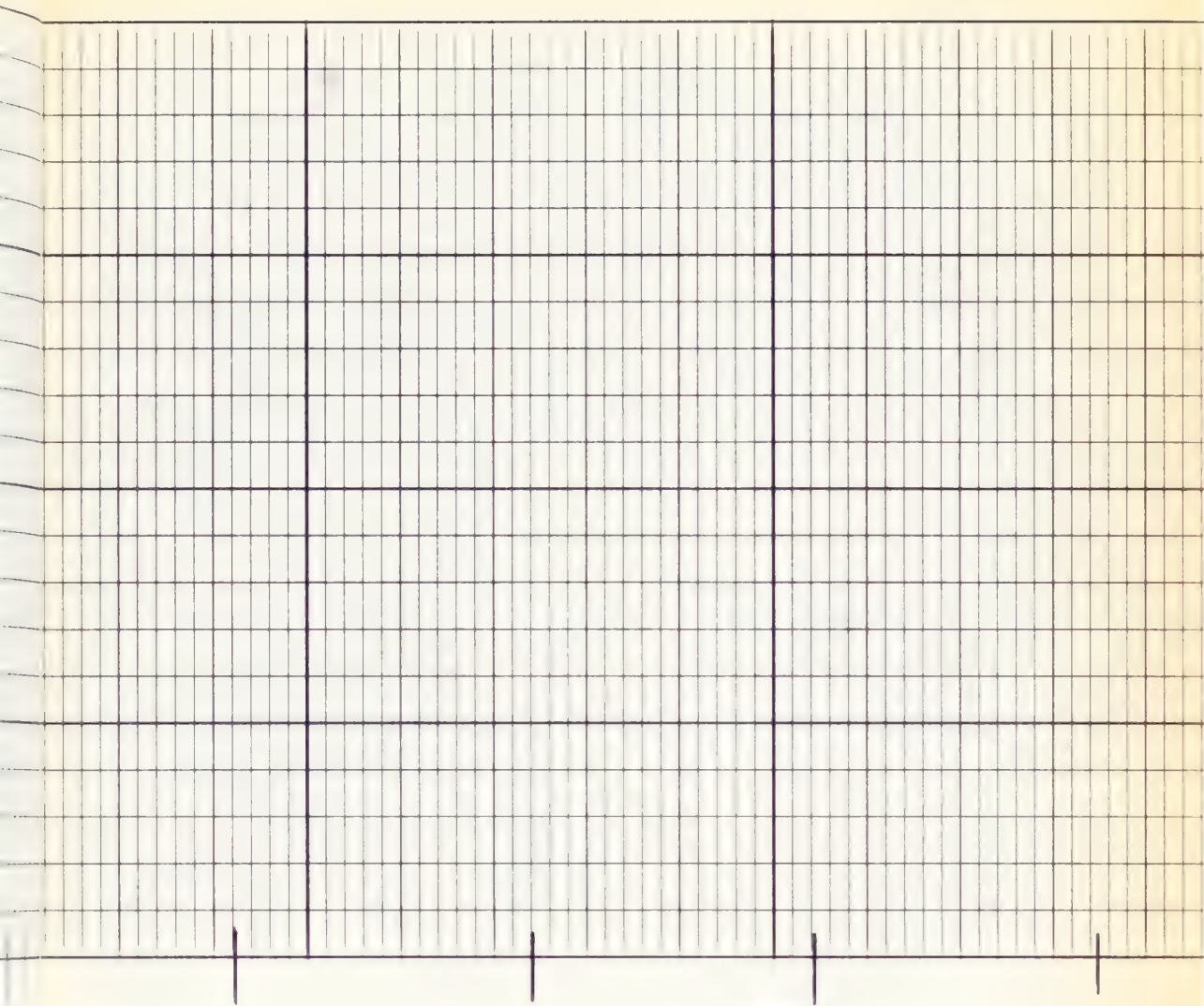




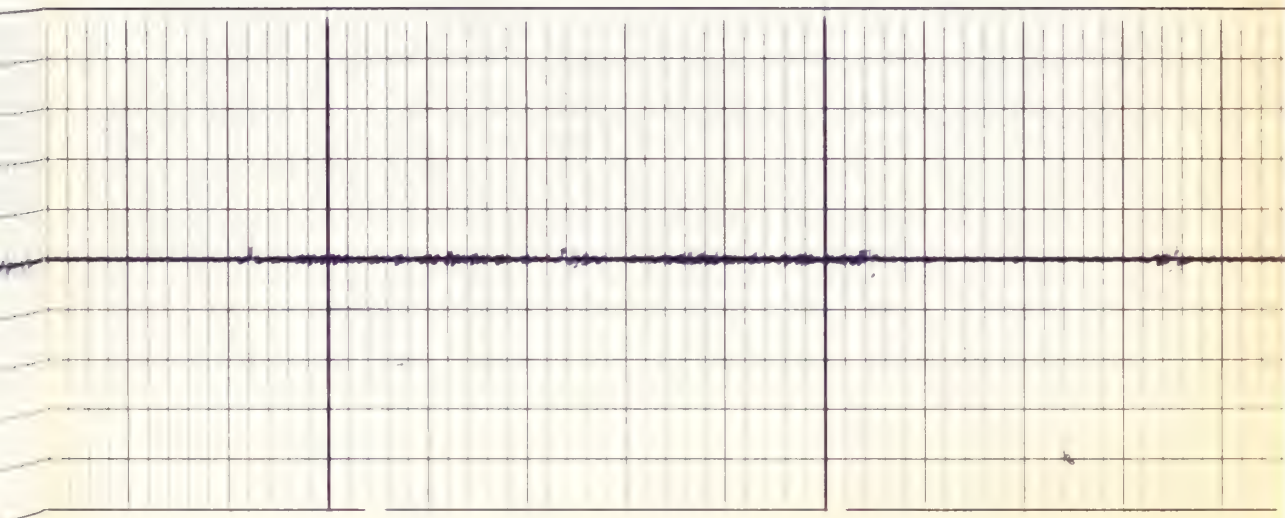
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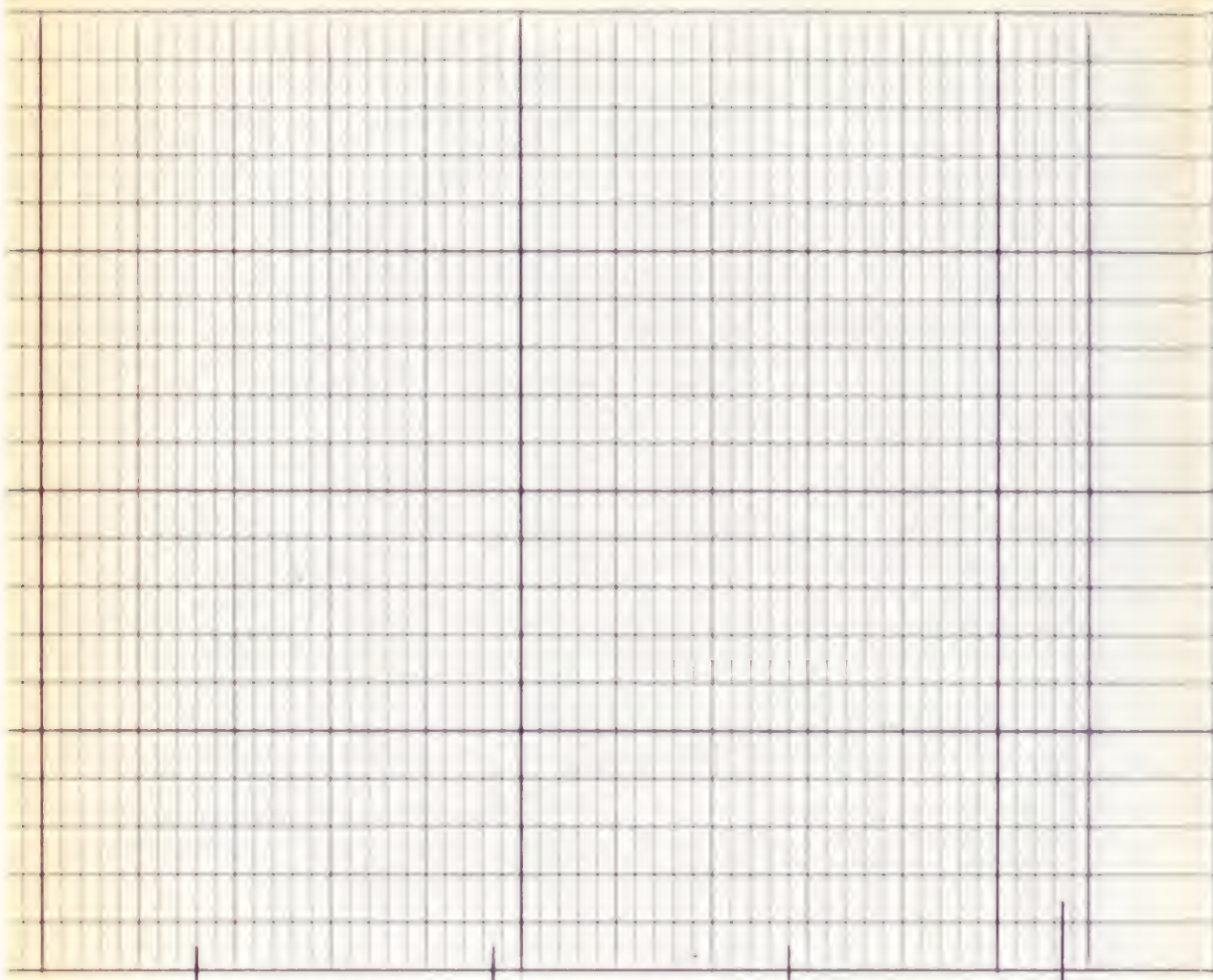




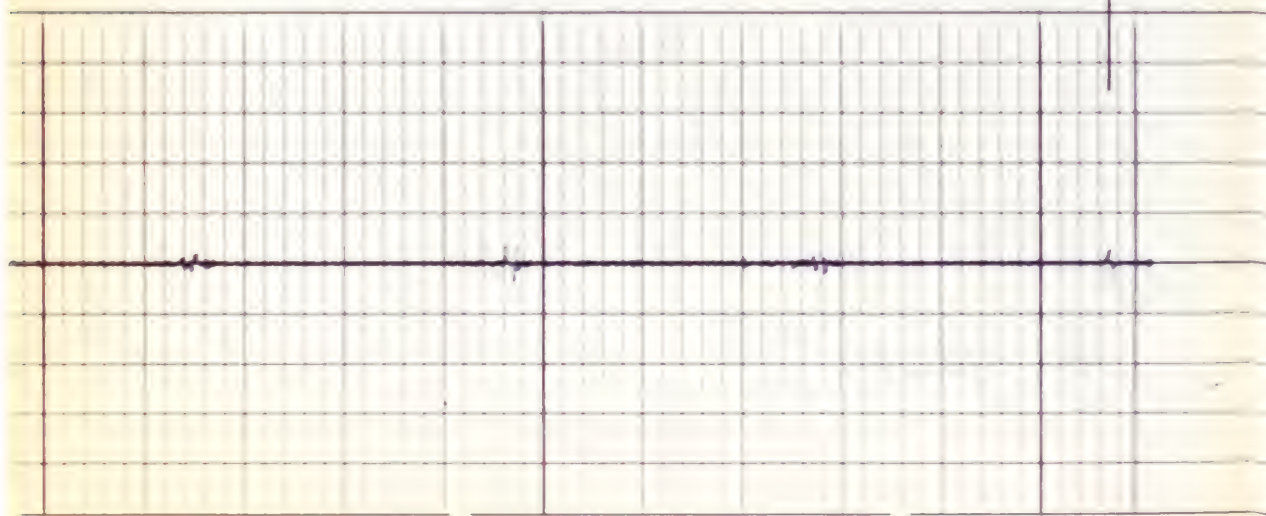


2300

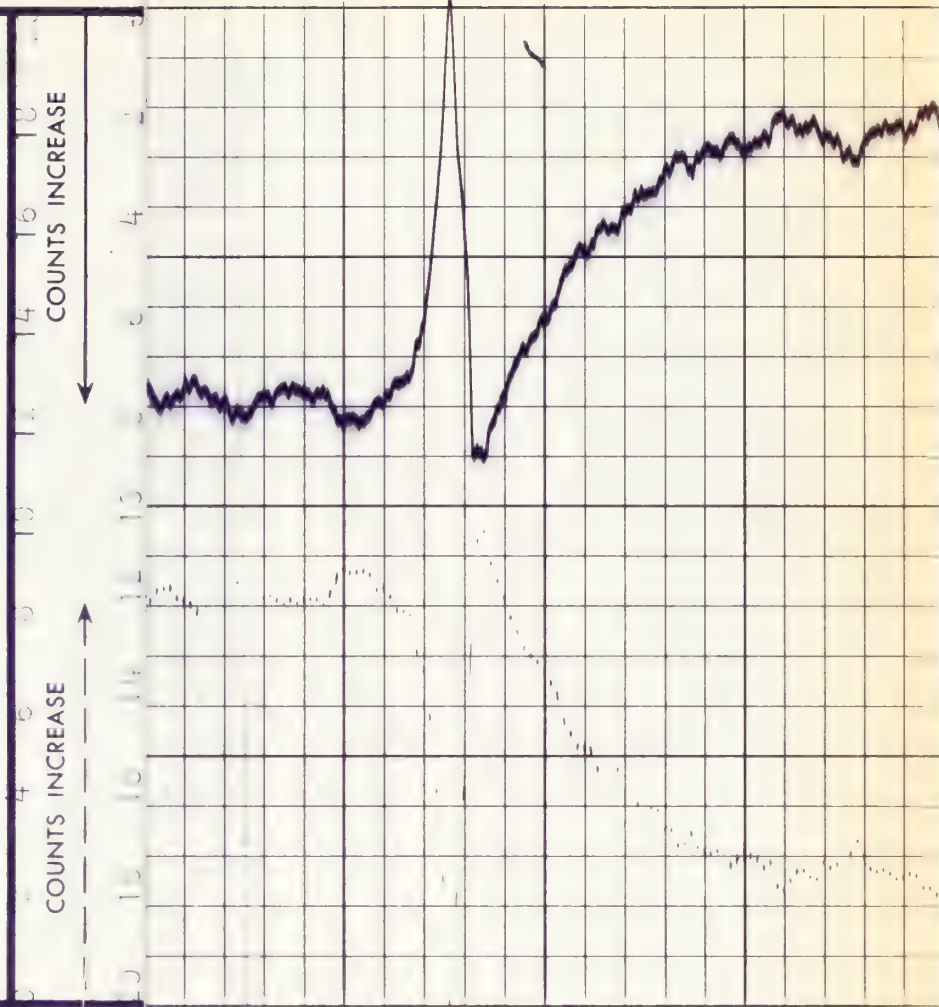


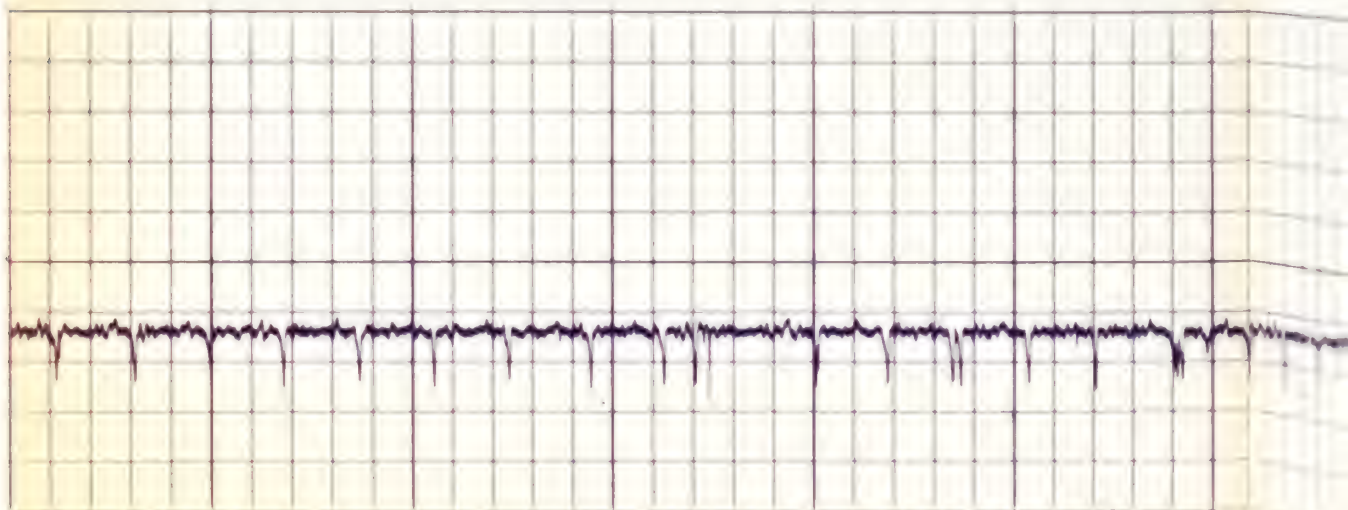
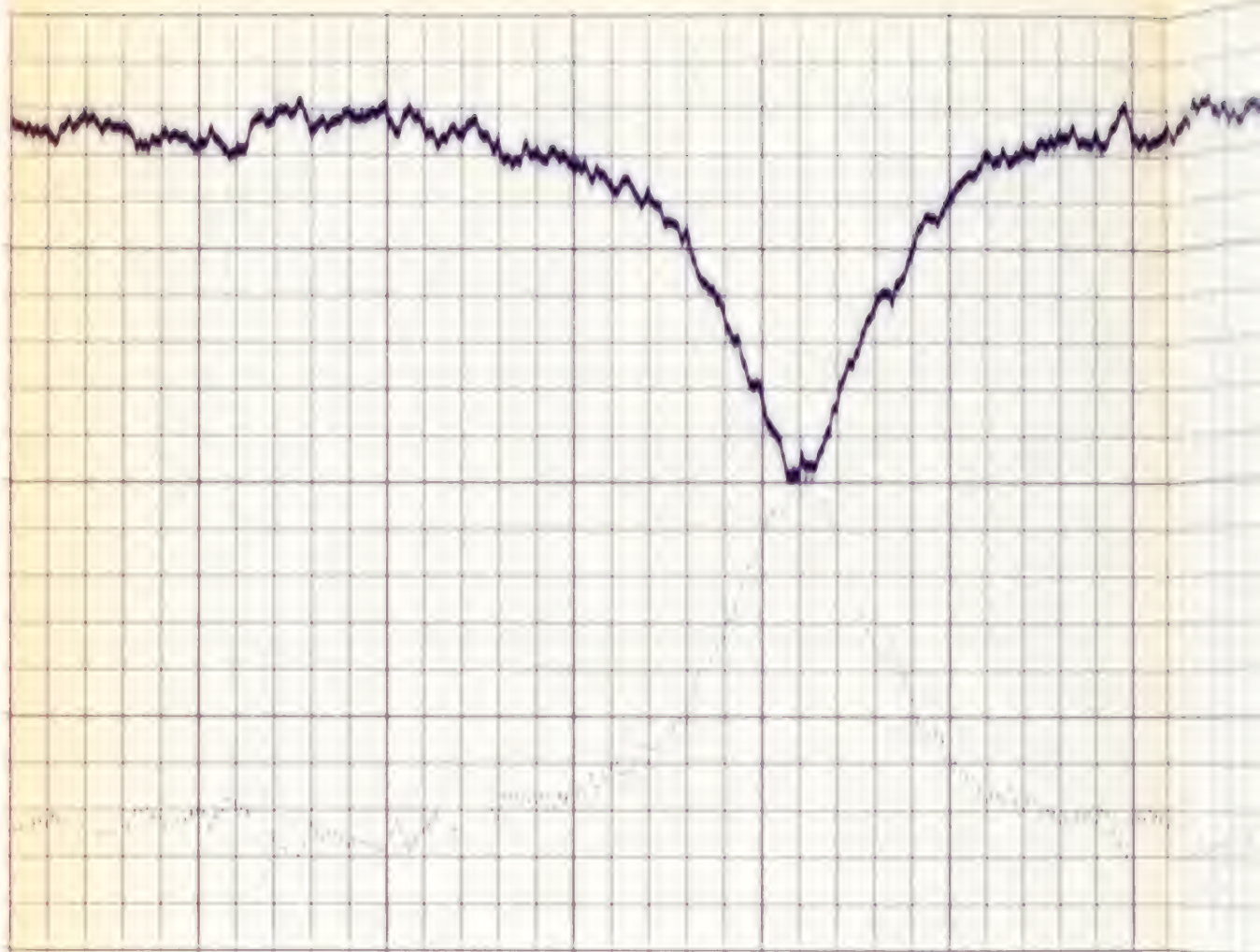


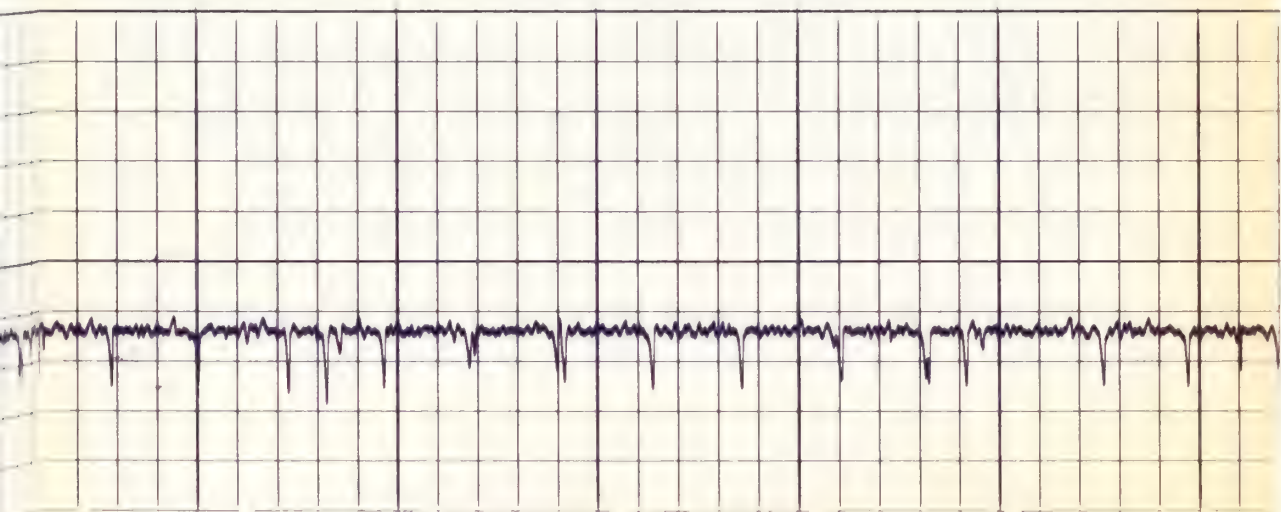
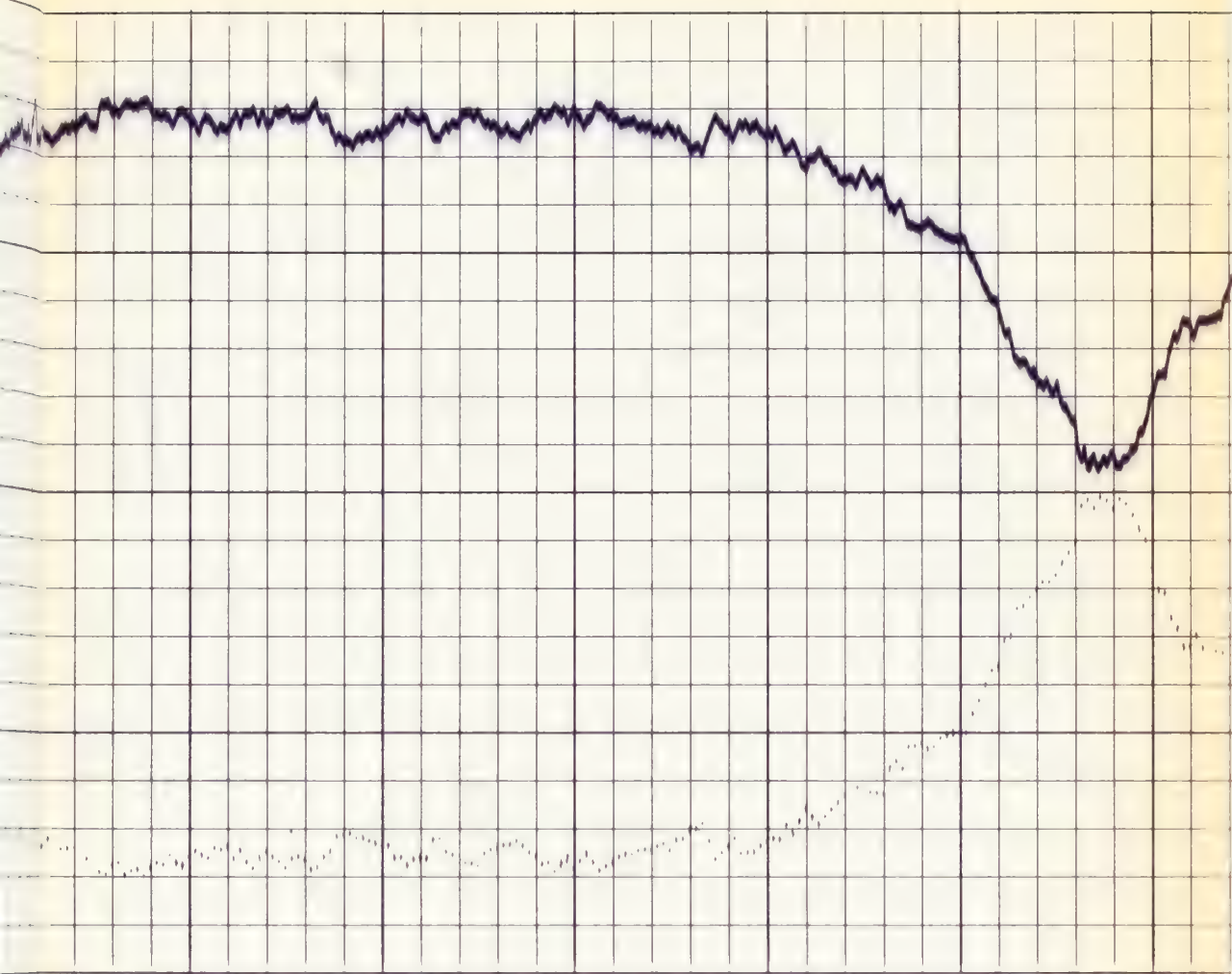
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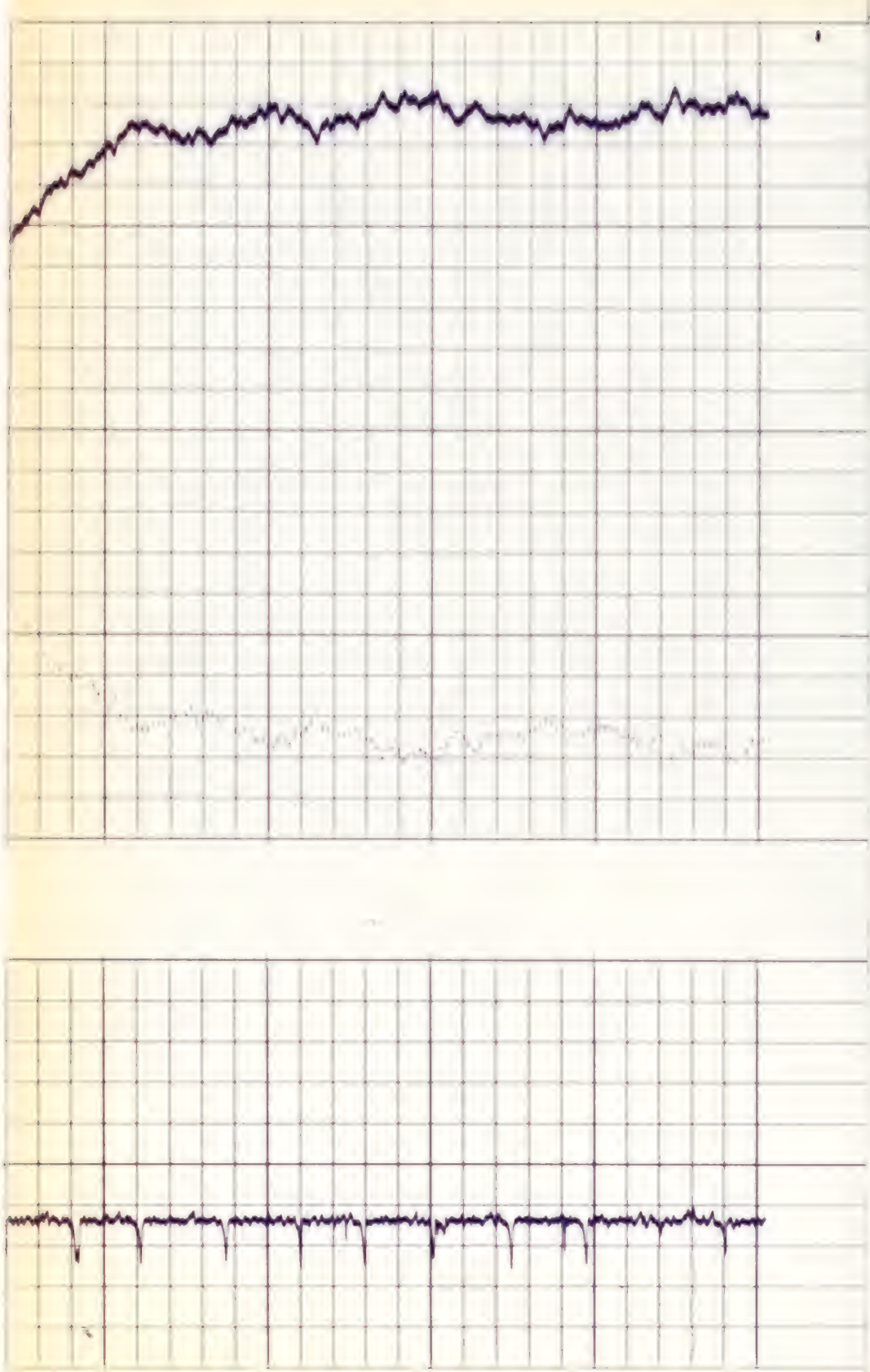


RADIO-ORIENTATION RECORD





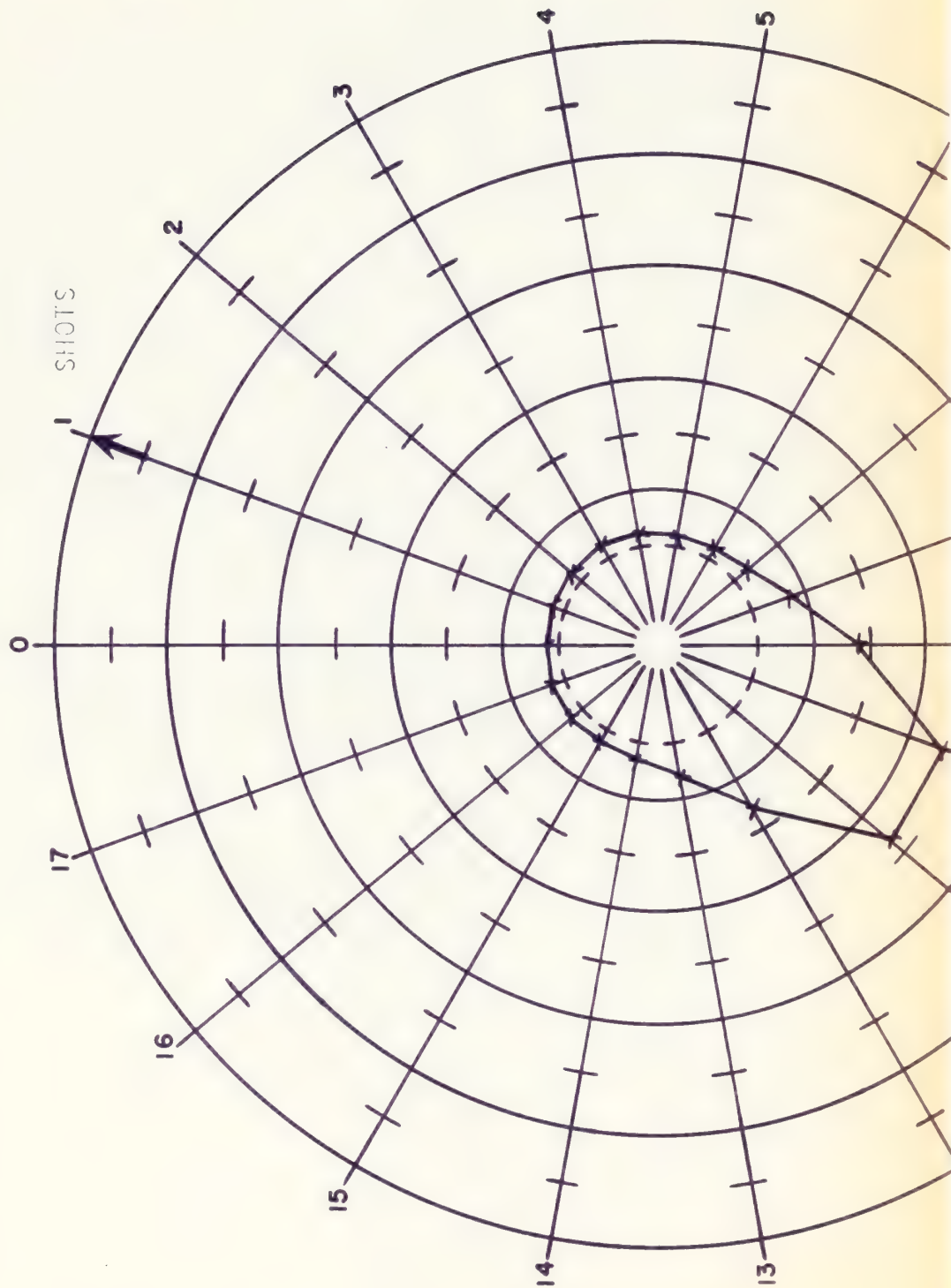


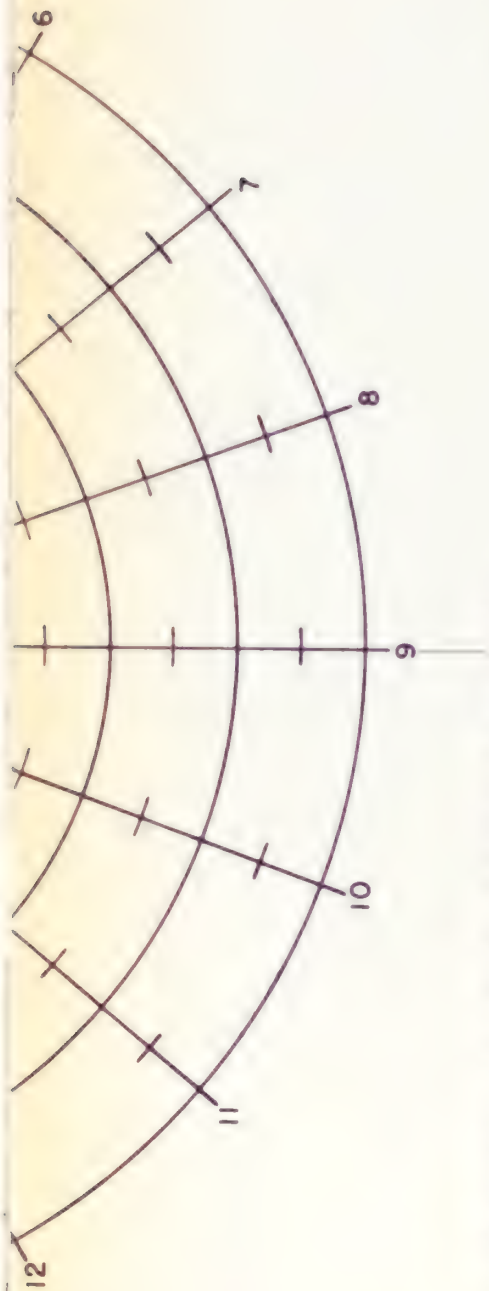


RADIORIENTATION PILOT

RADIATIONATION PLOT

POT-B

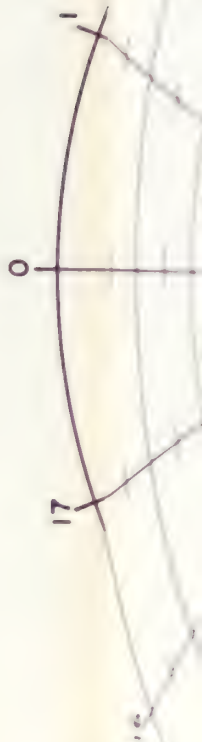




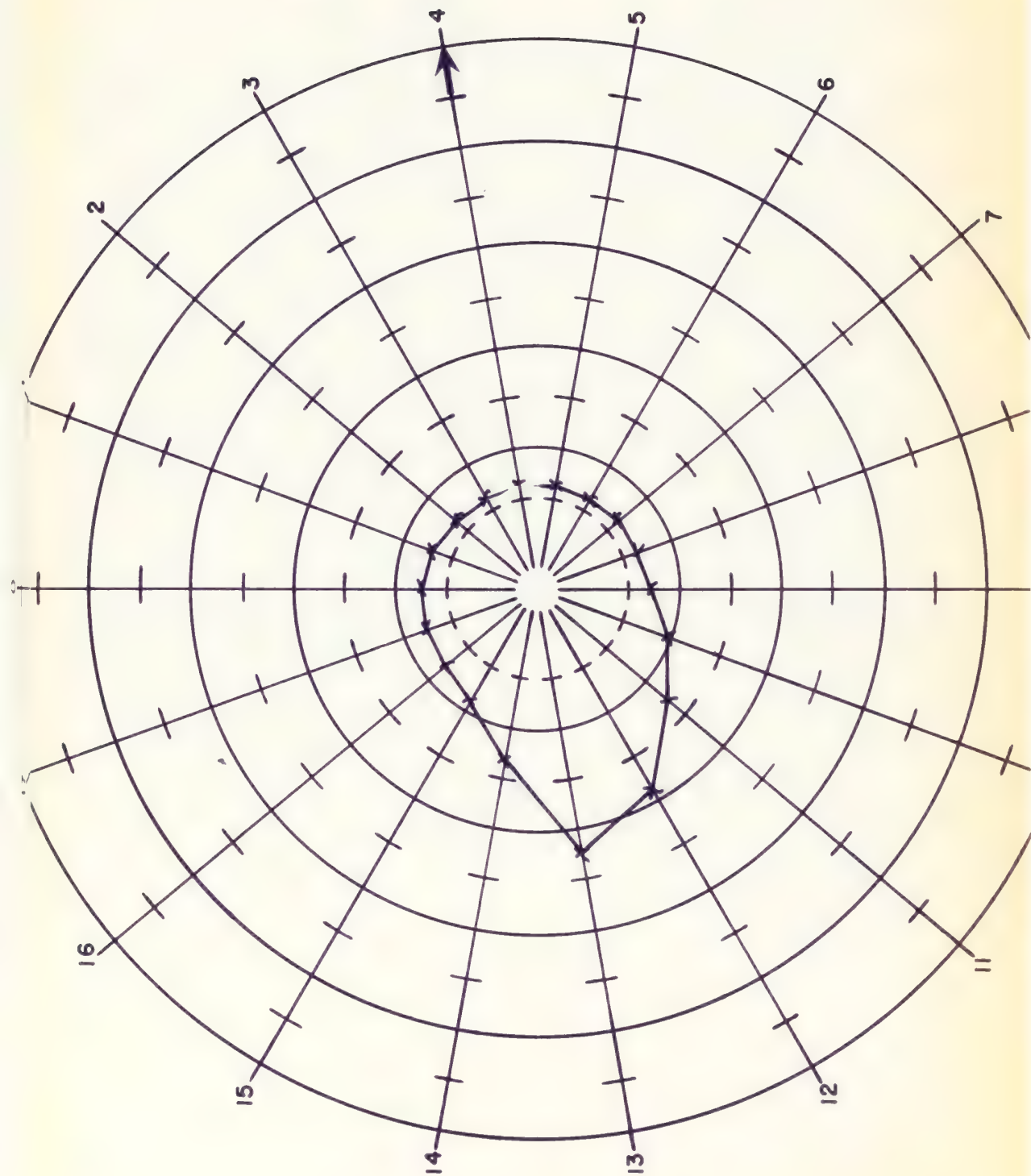
This chart, compilation and/or interpretation of our readings from our gamma-gauging instrument and the
 lecting instrument is presented to you in accordance with, but subject to the General Terms and Conditions
 as are set out on pages 1 and 2 of our current Price Schedule and which are set out on the reverse
 side of our Service Order for this job. The readings could be adversely affected by rugged terrain, the
 drill hole and other conditions unknown to us.

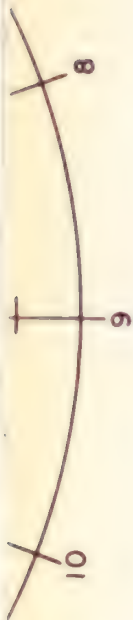
Schlumberger

RADIOORIENTATION PLOT POT-B



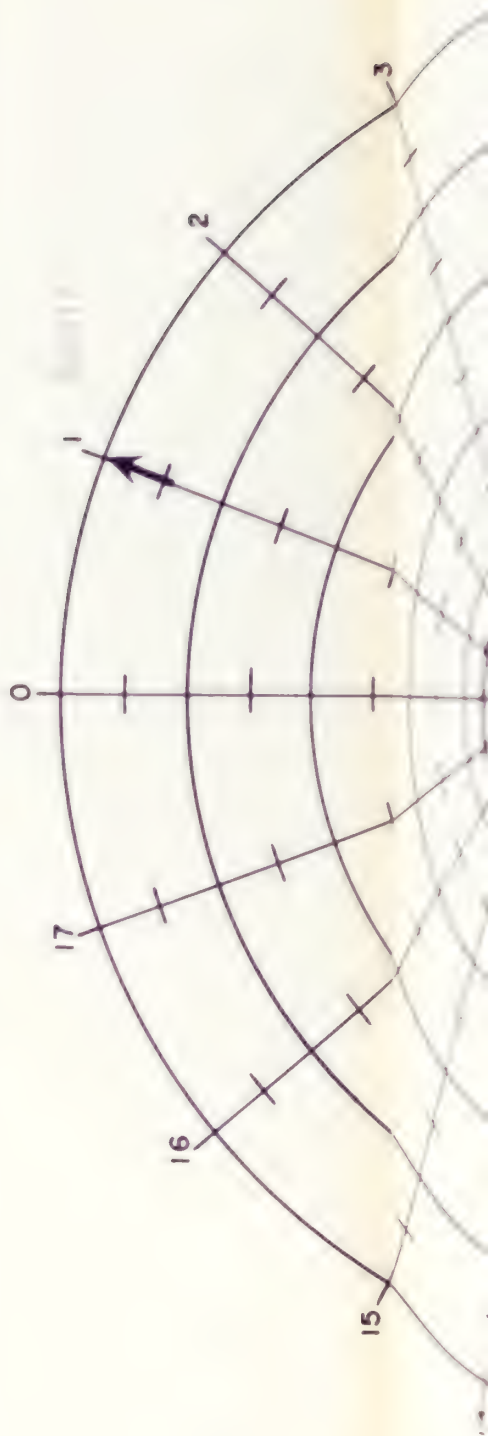
SHOTC

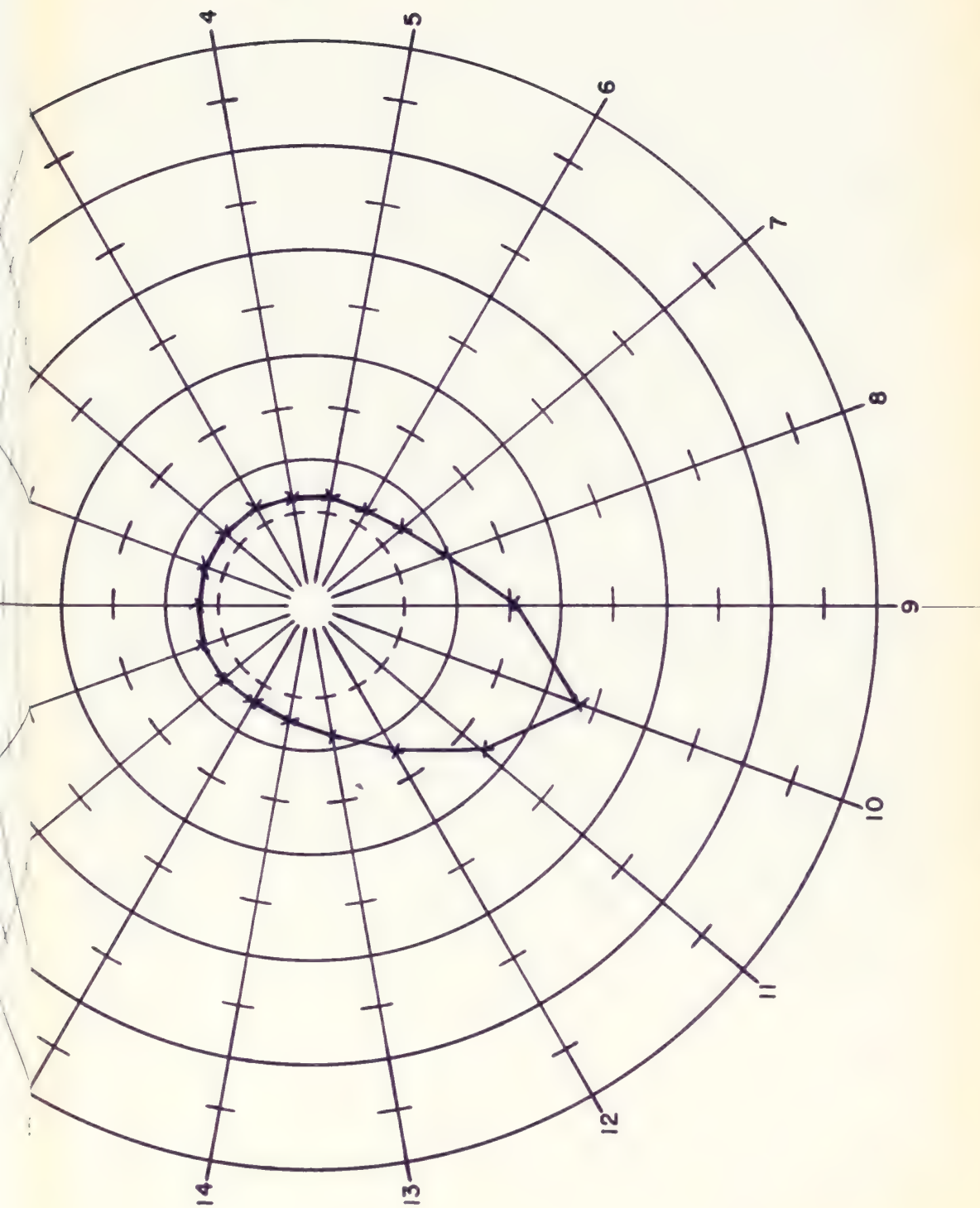




This chart, computation and/or interpretation of our readings from our gamma-galvanometer and reflecting instrument is presented to you in accordance with, but subject to the General Terms and Conditions as are set out on pages 1 and 2 of our General Price Schedule and which are to be set up on the reverse side of our Service Order for this job. The readings could be adversely affected by magnetic fields in the drill hole and other conditions unknown to us.

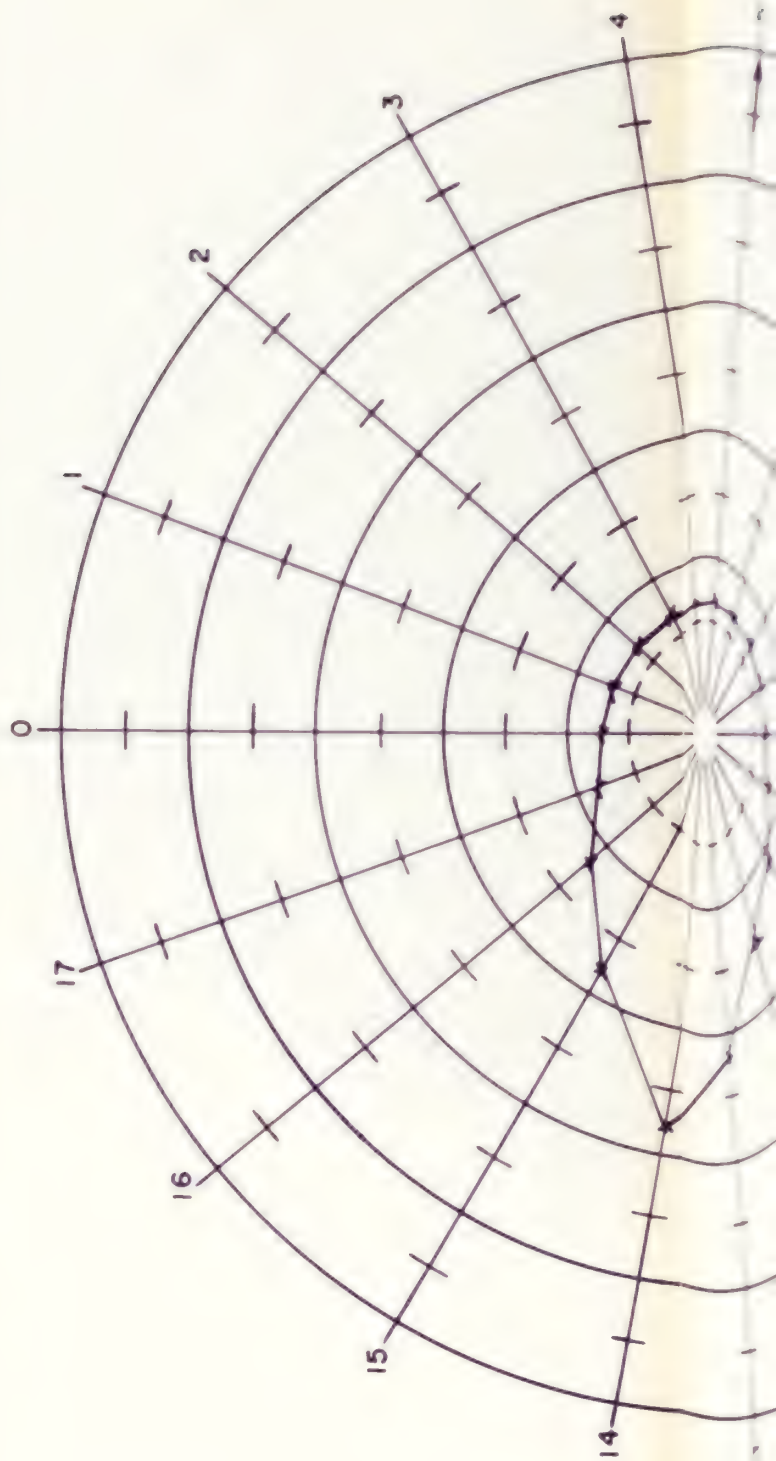
RADIO-ORIENTATION PLOT POT-8

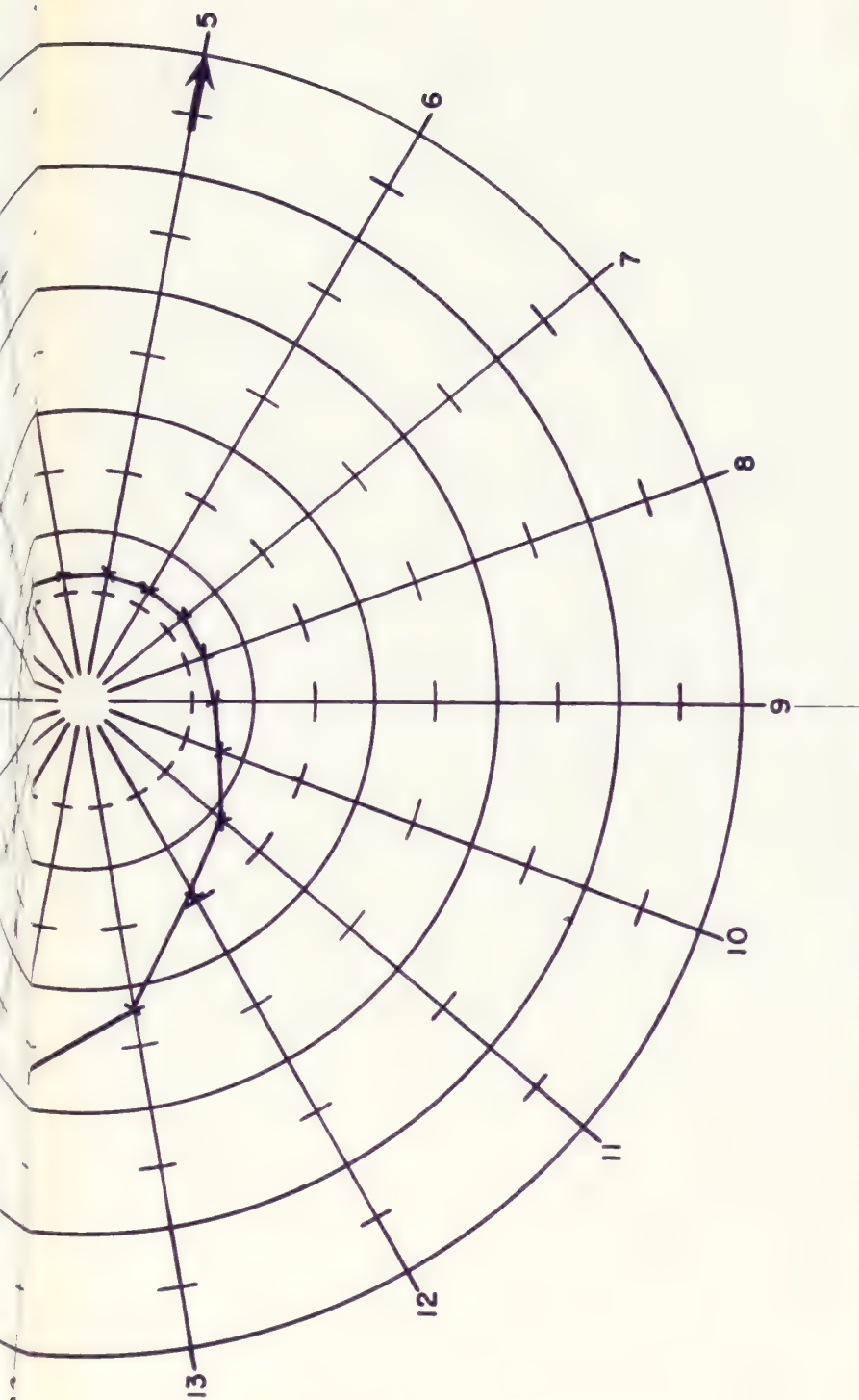




This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of this book. The readings could be adversely affected by variant metal in the

POT-B



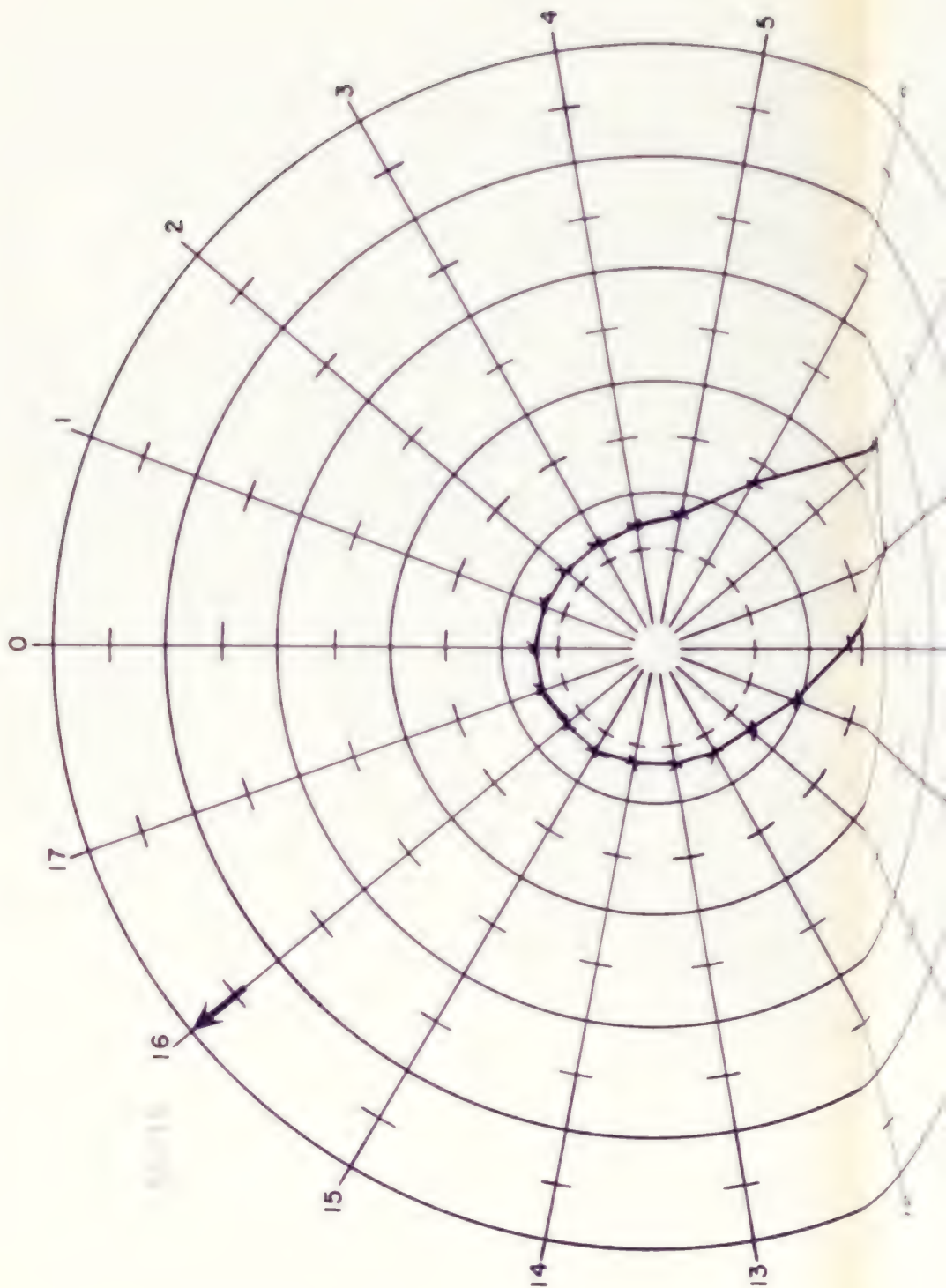


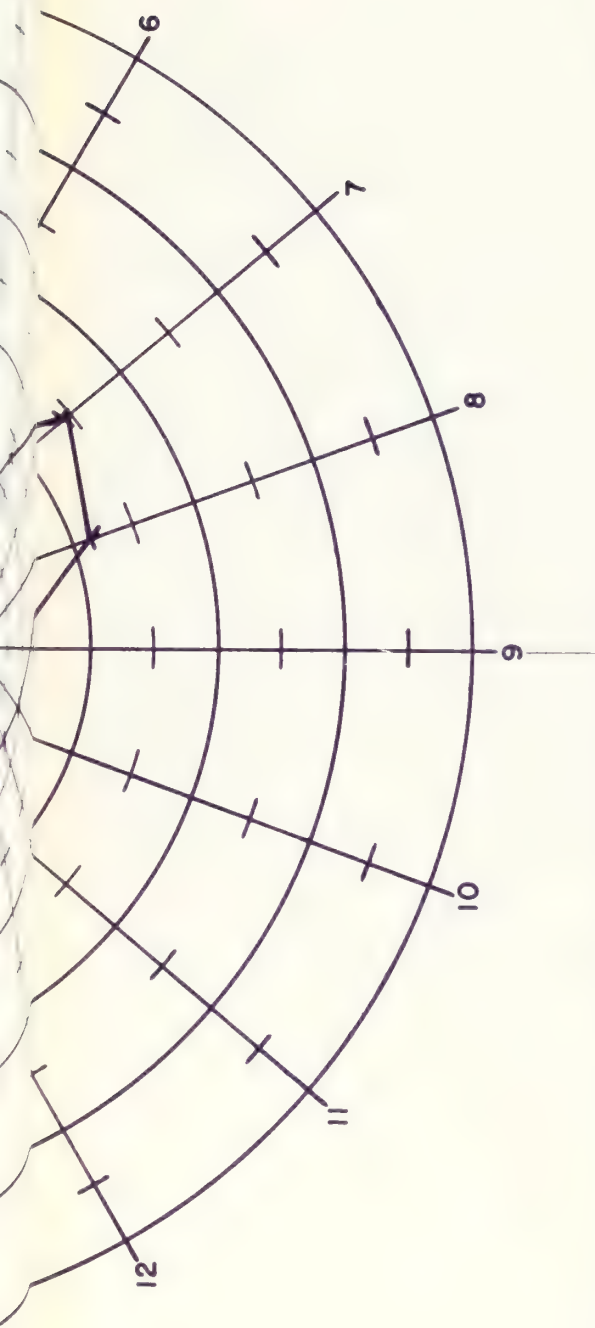
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIO-ORIENTATION PLOT

POT-B





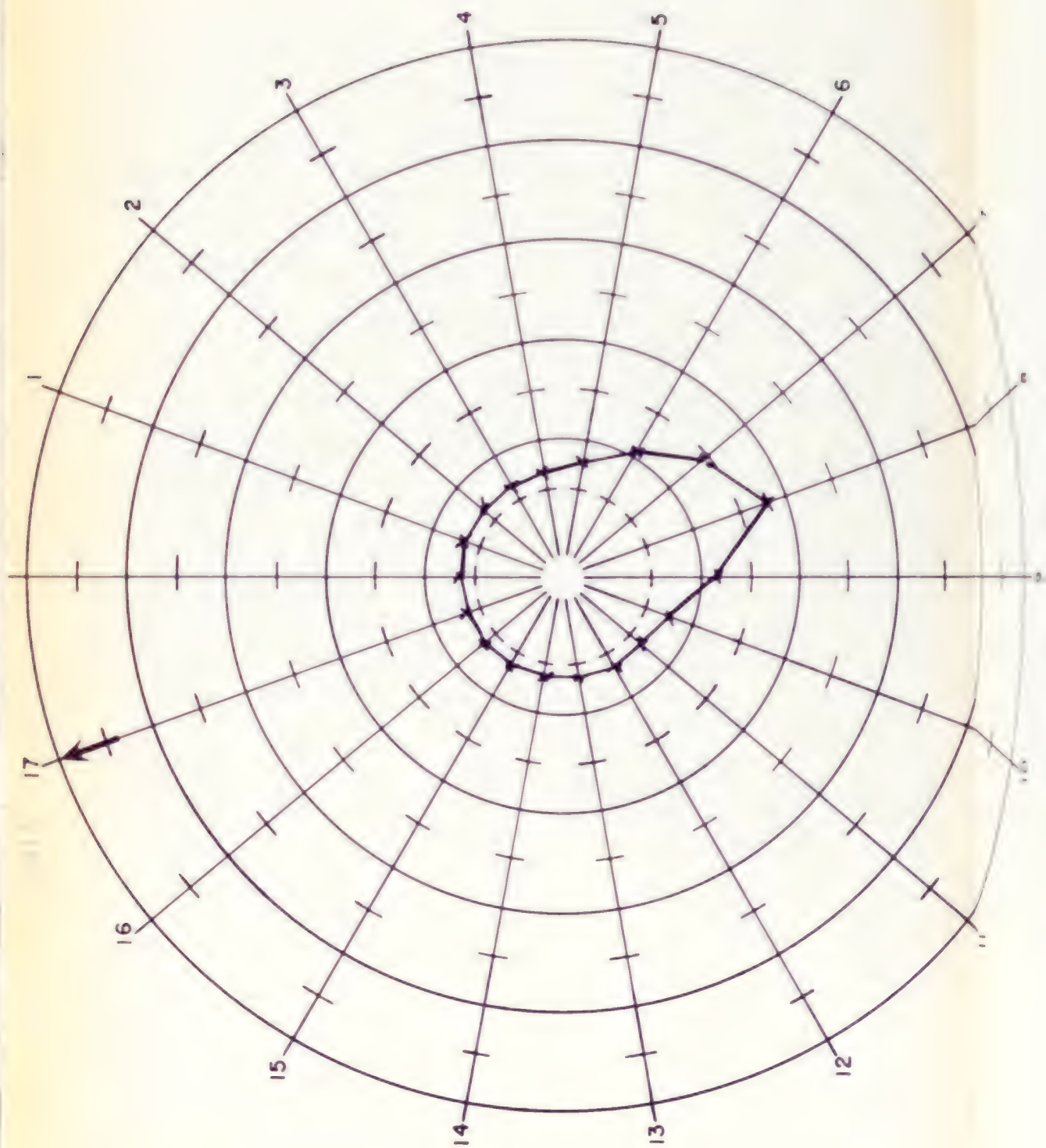
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

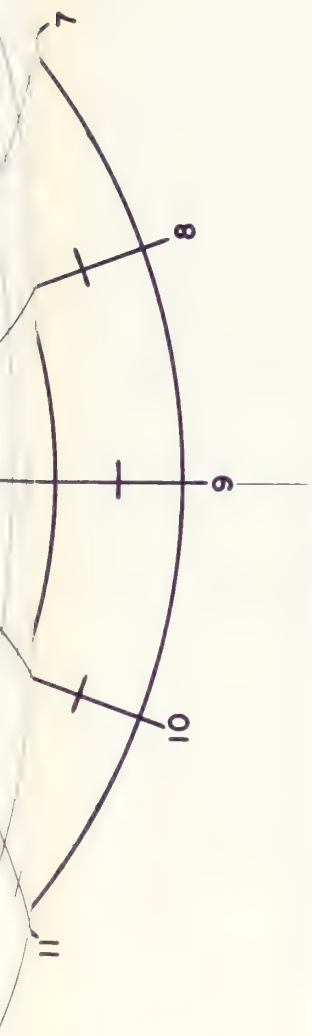
Schlumberger

RADIOORIENTATION PLOT

POT-B

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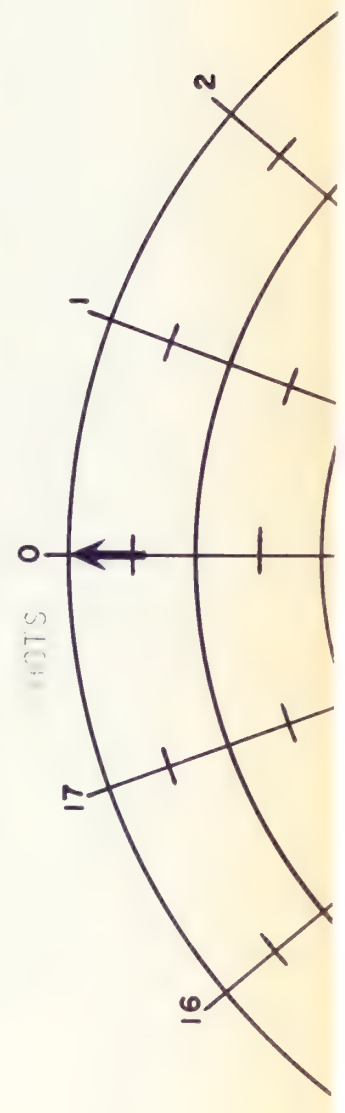


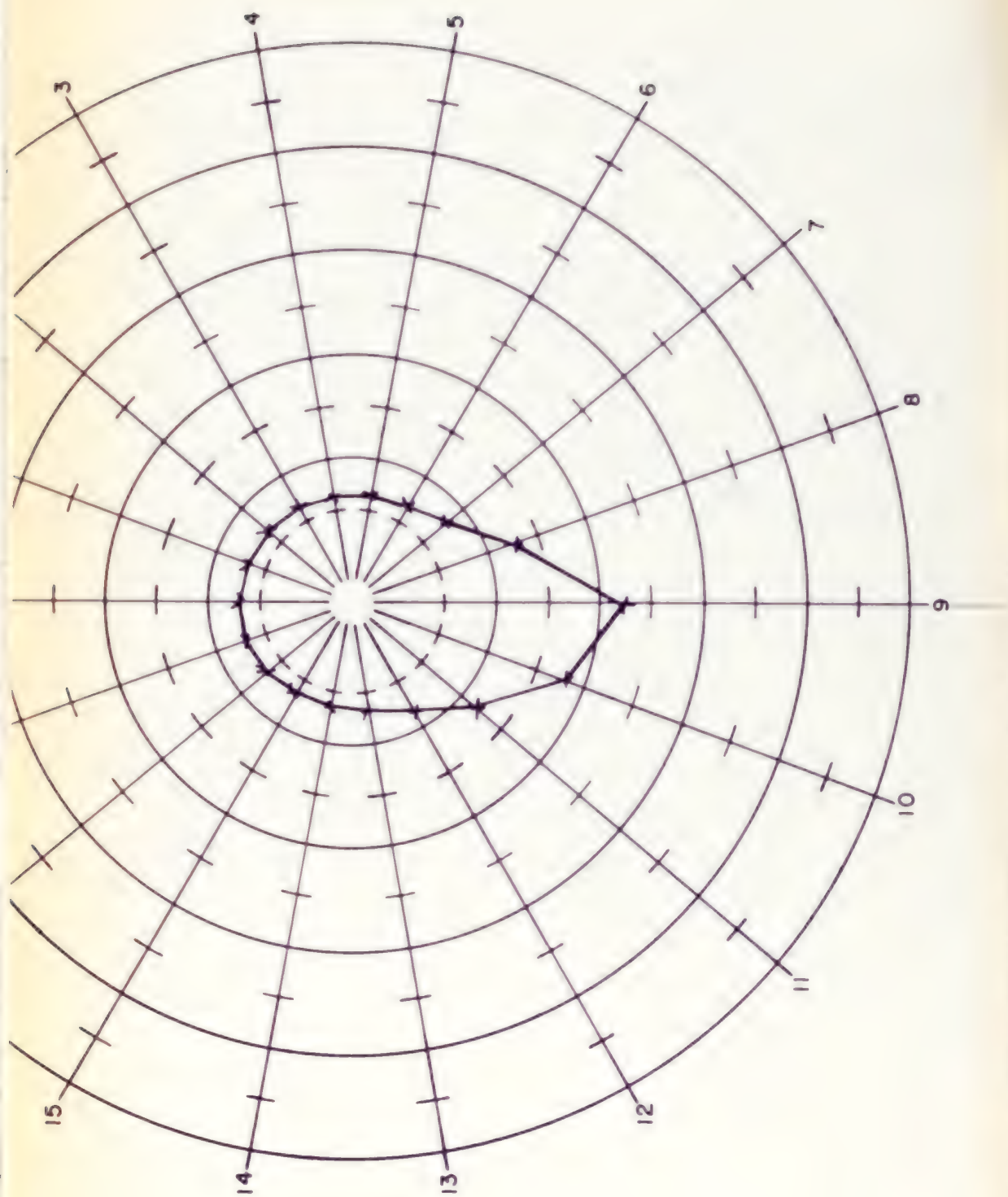
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.



RADIO-ORIENTATION PLOT POT-B

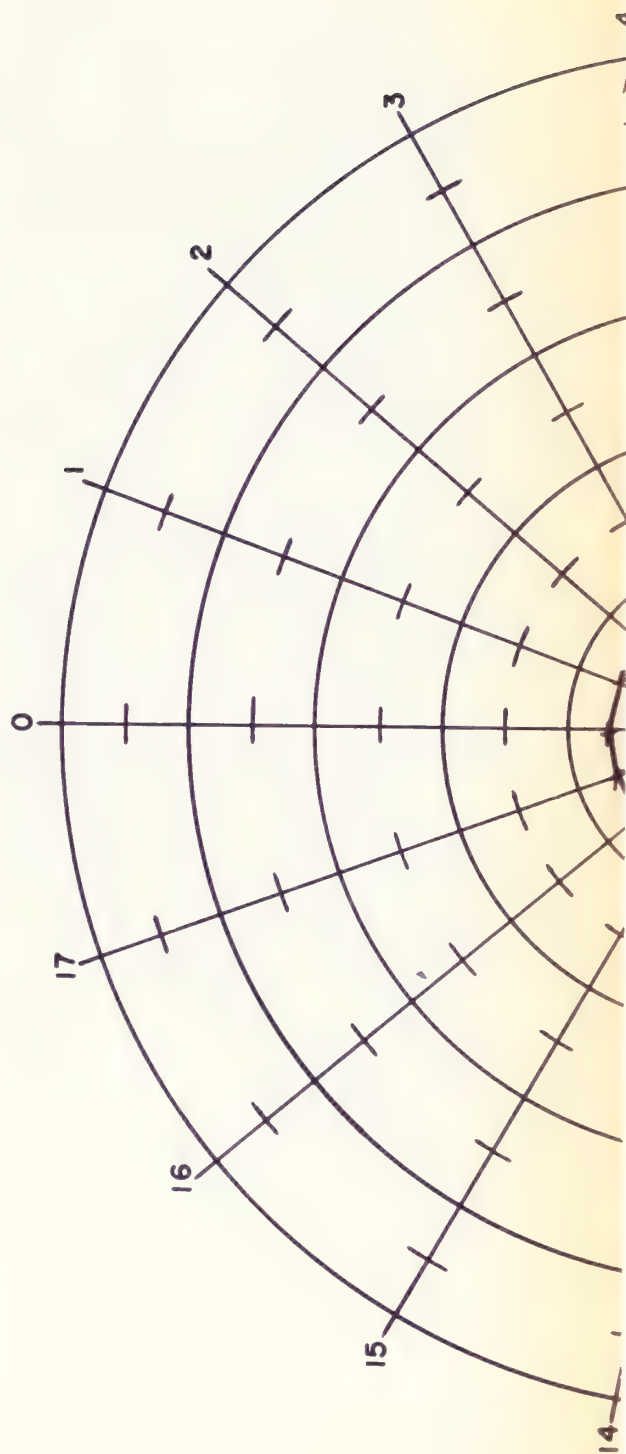
NO. 1- 216 STRING-PERFORATED 1146-1156 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME



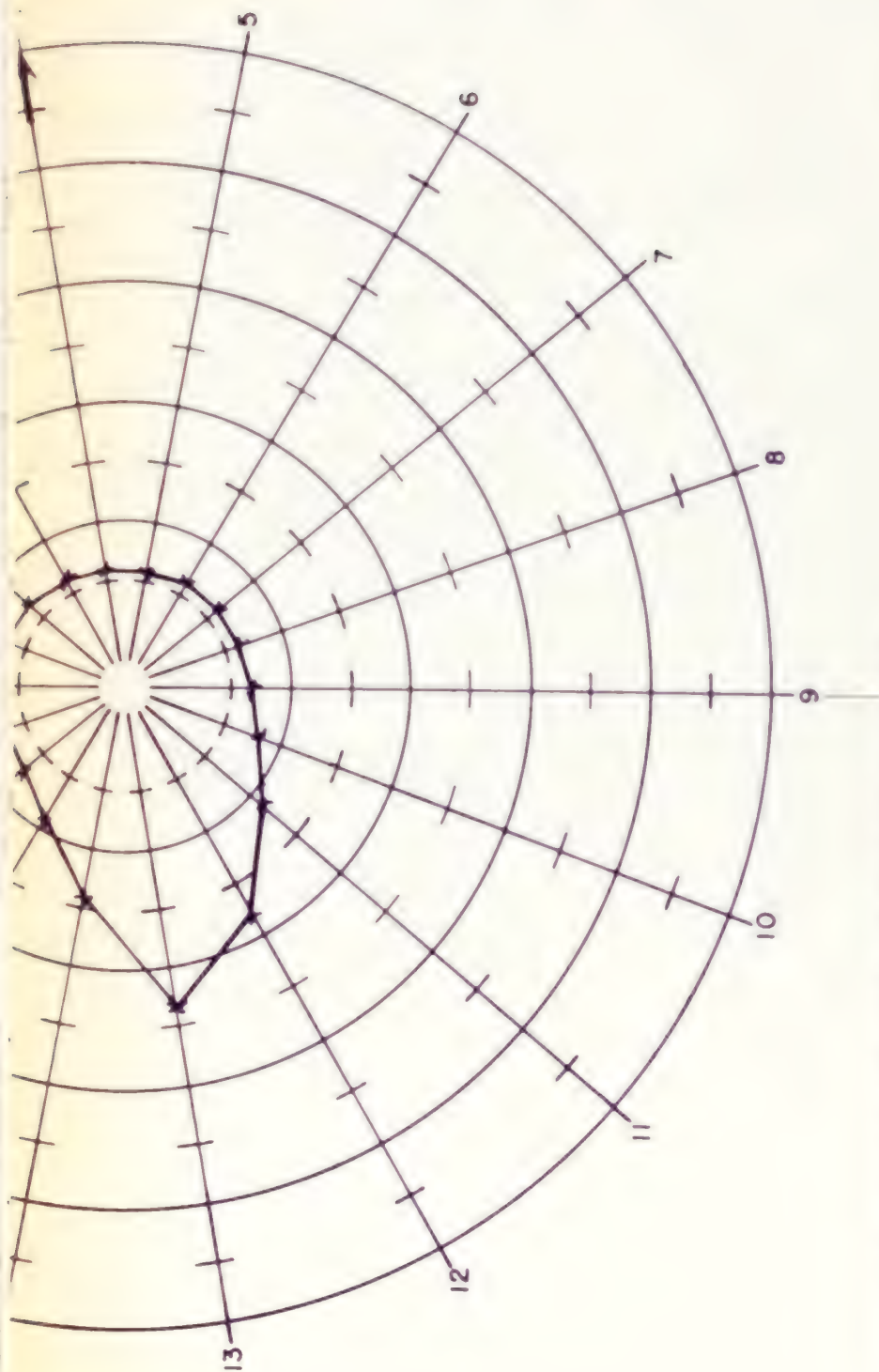


POT-B

TEST REF ID: A66 1104-1114 MP SHOT PER FOOT WITH 1 11/16" HYPERCYE



Schlumberger

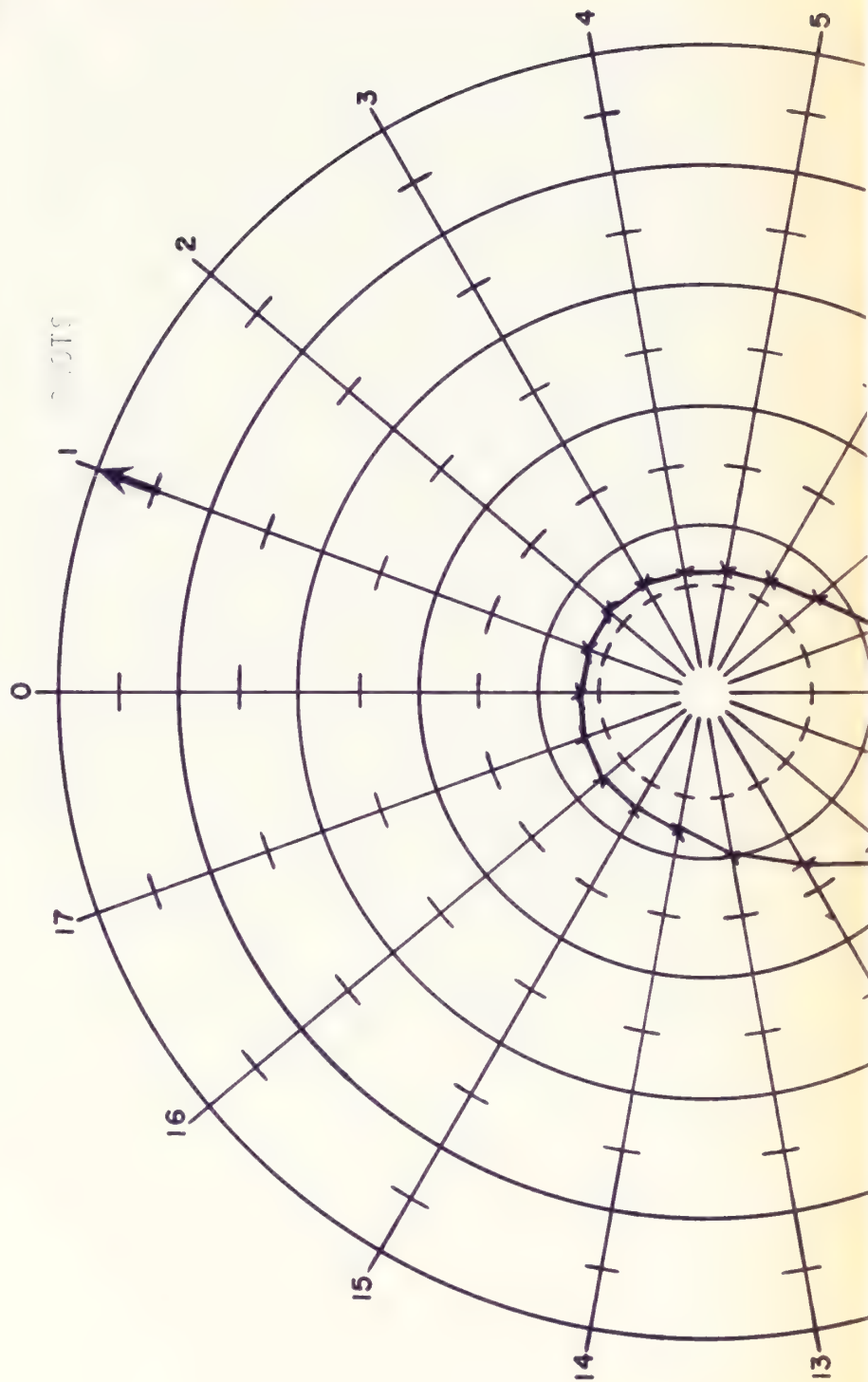


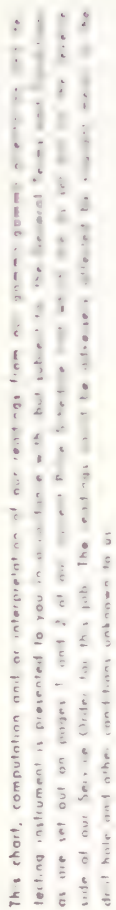
This chart, computation and/or interpretation of our readings from our gamma probe instrument and the testing instrument is presented to you in assistance with, but subject to the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and as are set out on the reverse side of our Service Order for this job. The readings could be adversely affected by unreported metal in the drill hole and other conditions unknown to us.

RADIO-ORIENTATION PLOT

POT-B

W. 1-000 CIRCUIT-PERFORATED 10/2-110-0000 SHOT 11R FOOT WITH 1 11/16" HYPERCOCKE



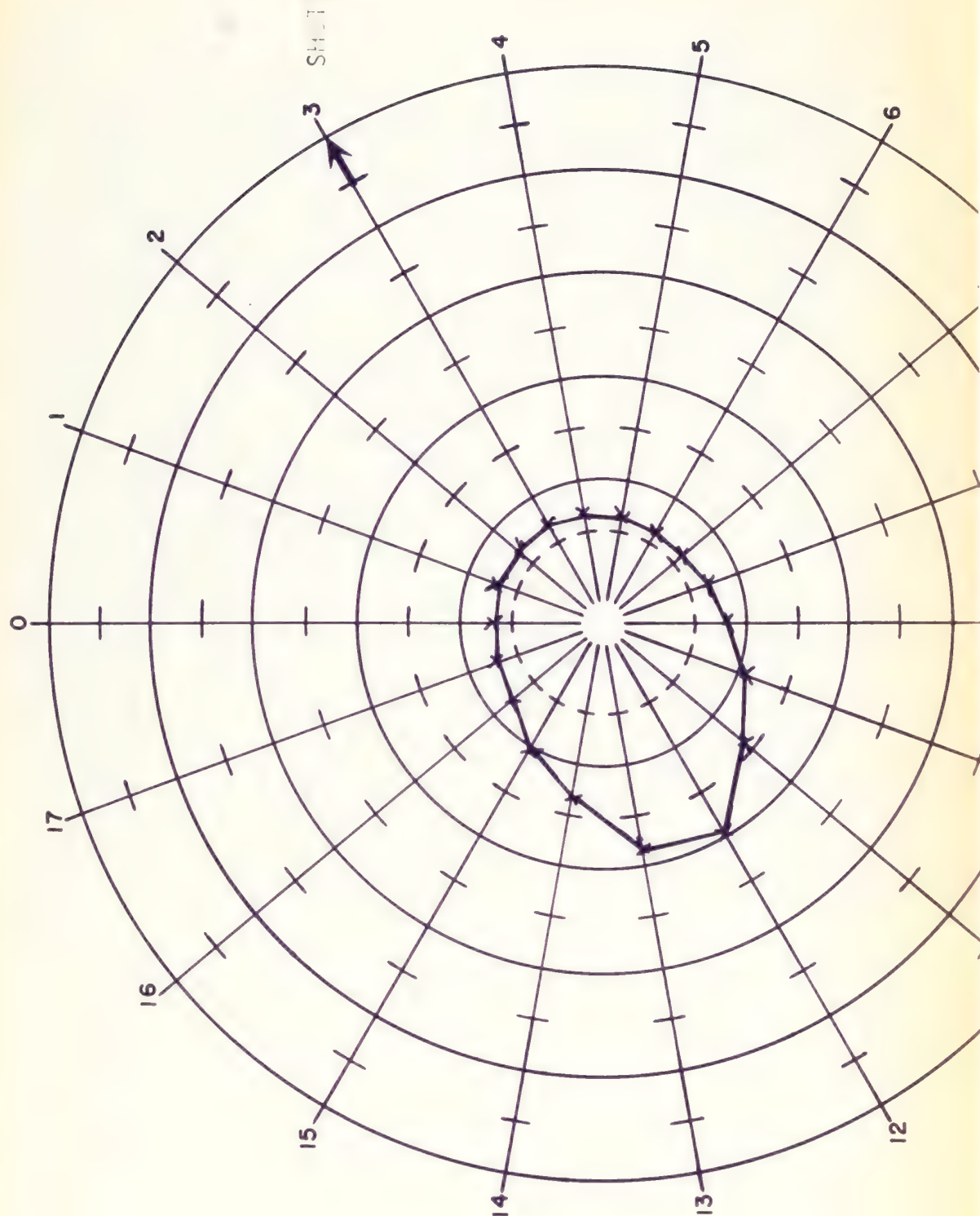


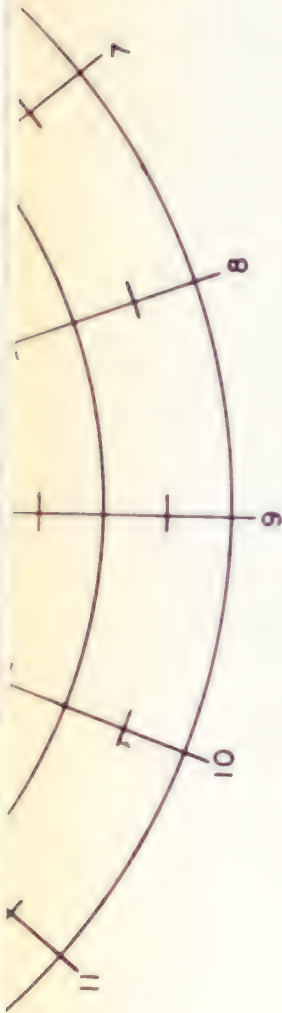
Schlumberger

RADIORIENTATION PLOT

POT-B

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

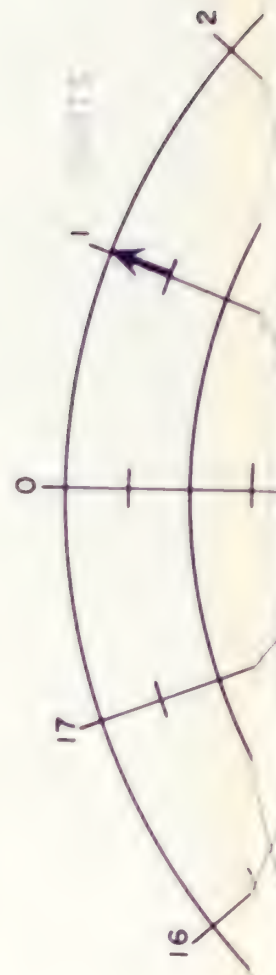


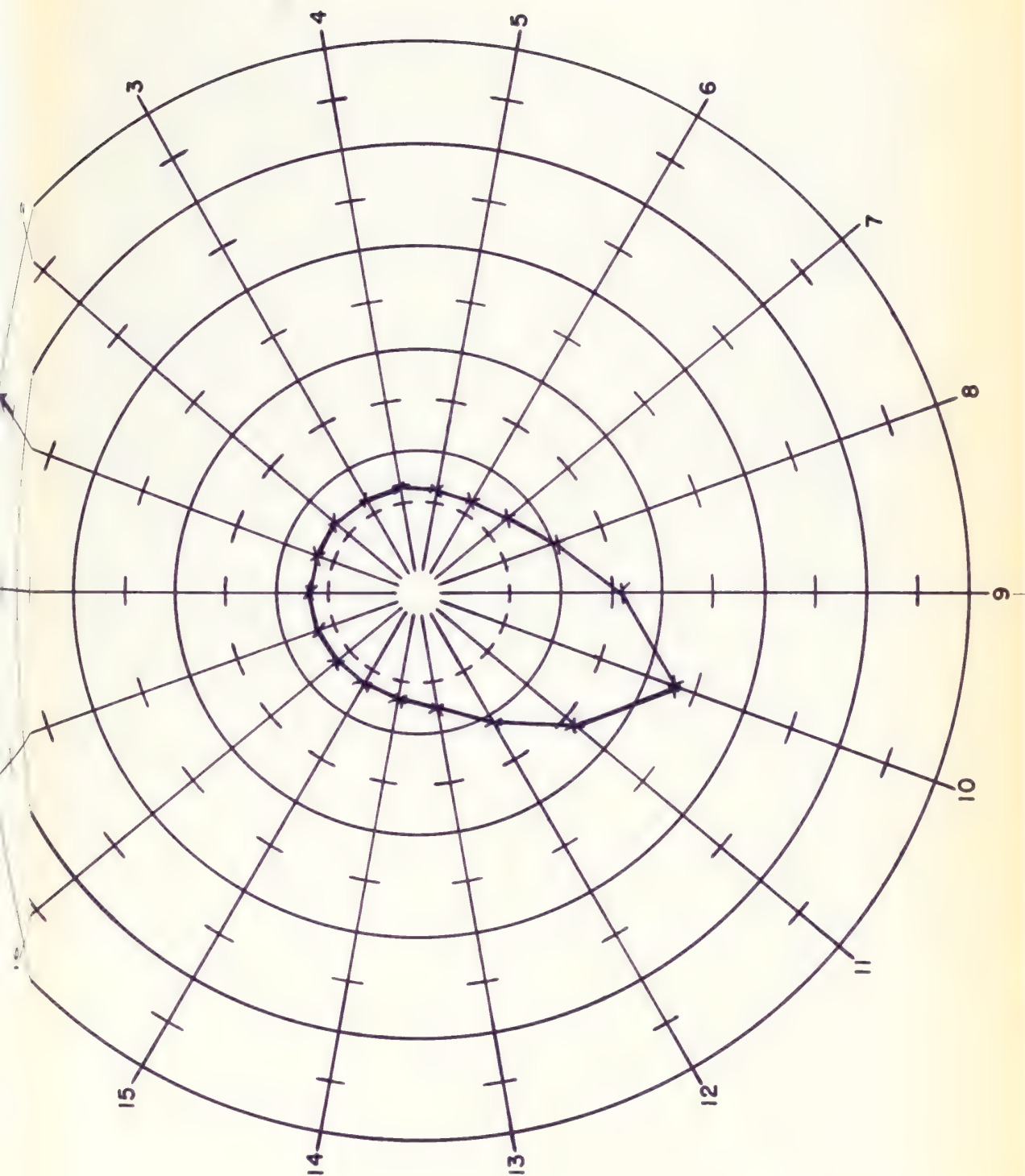


This chart, computation and or interpretation of our readings from our gamma probe instrument, and the
 lecting instrument is presented to you in some form with the following facts: the instrument is not to be used
 as are set out on pages 1 and 2 of our gamma probe instruction and which are set out in the form
 side of our Service Order for this job. The readings must be obtained by using the hole in the
 drill hole and other conditions unknown to us.



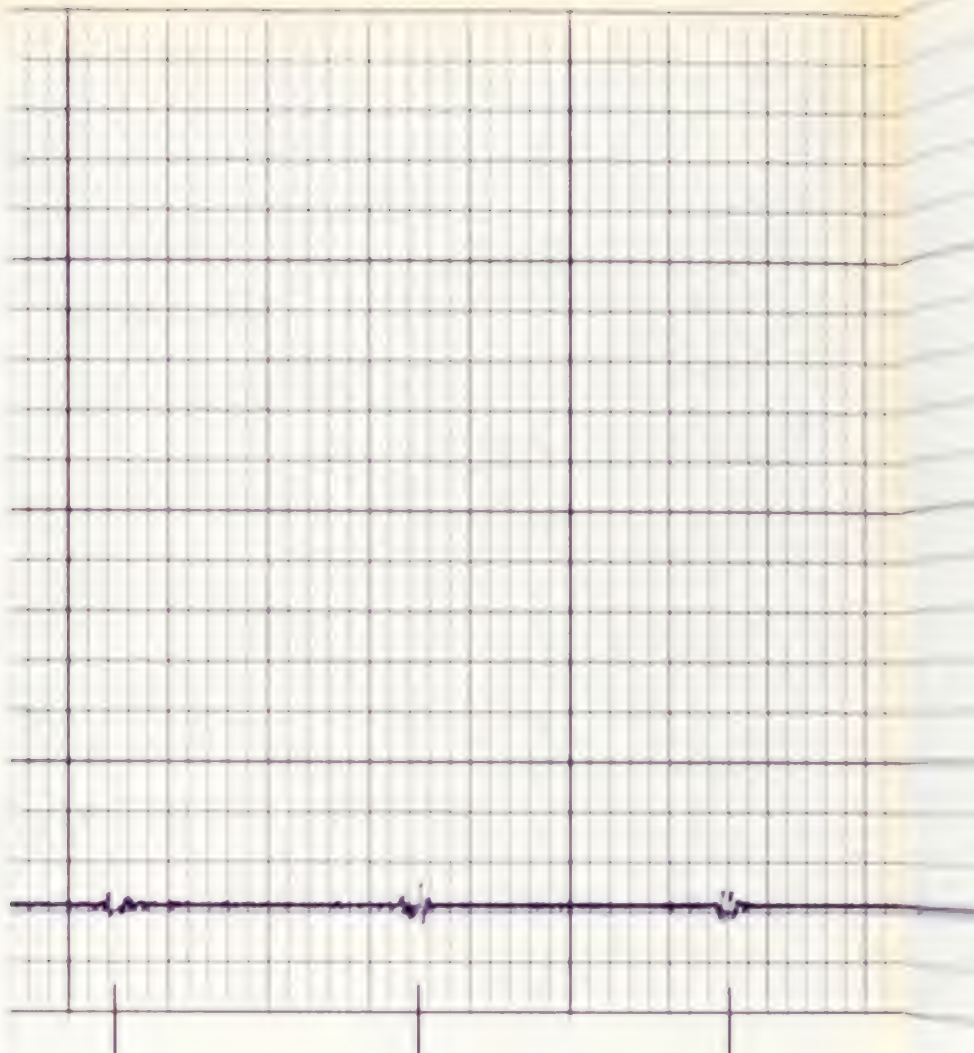
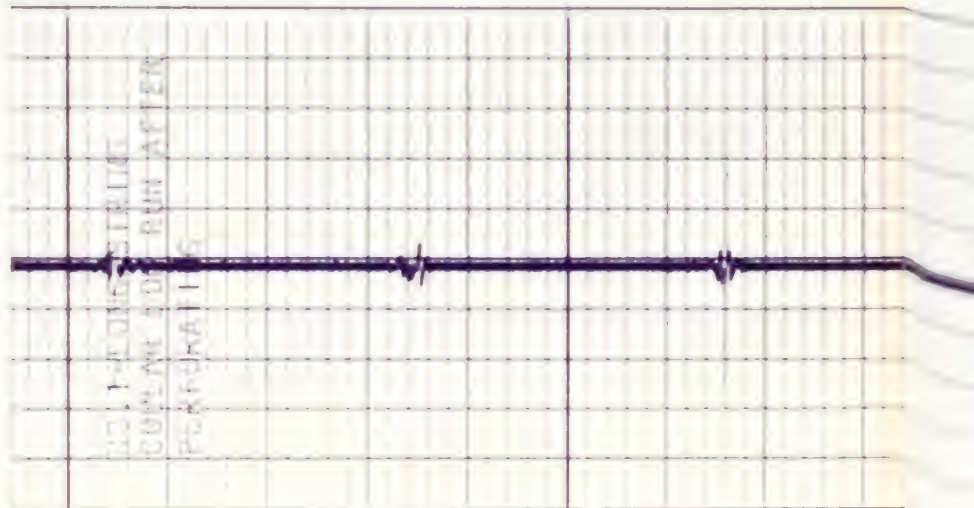
RADIORIENTATION PLOT POT-B

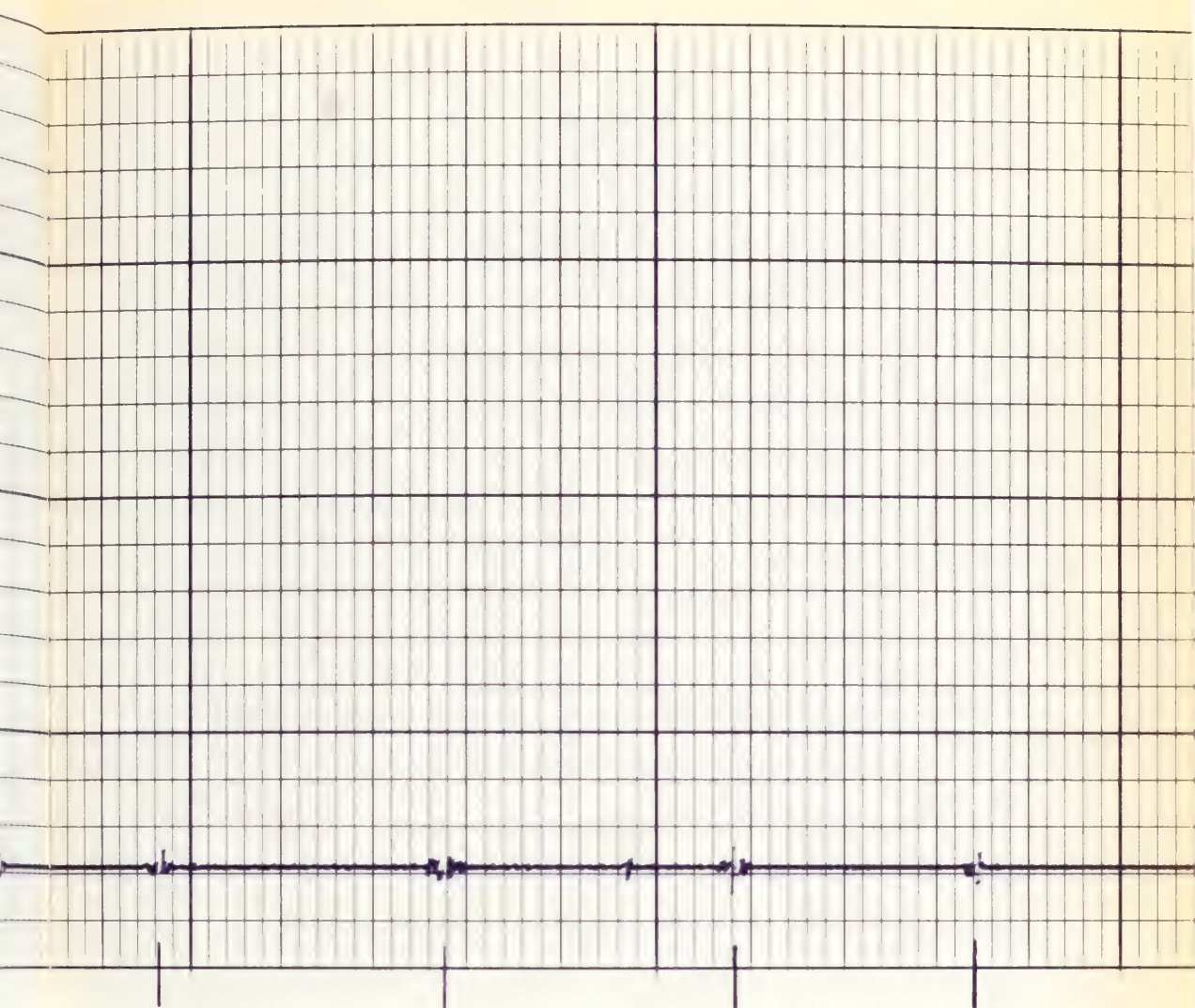




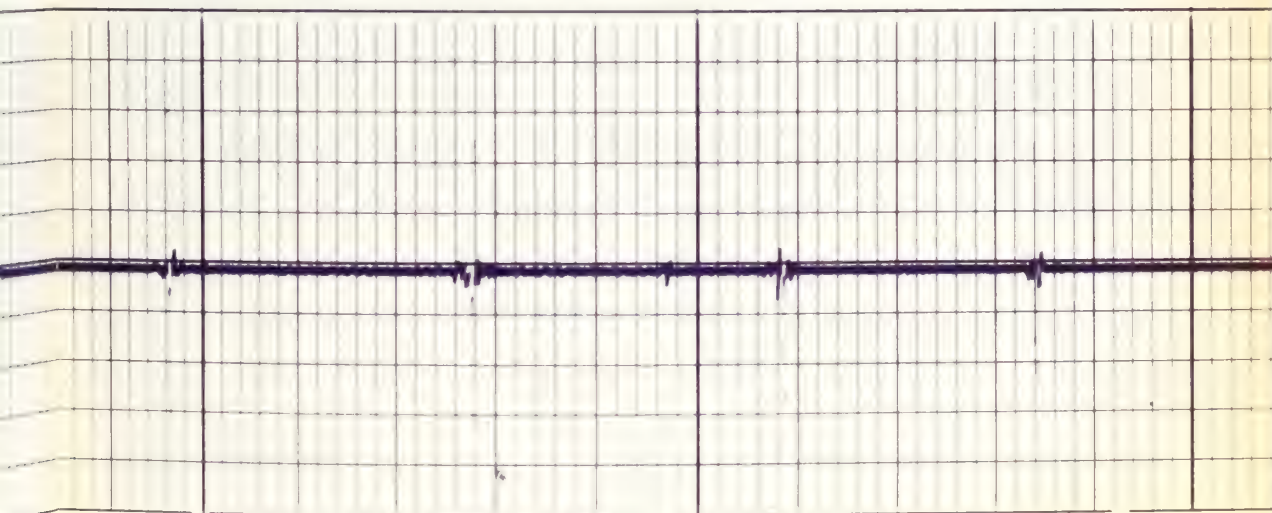
This chart, computation and/or interpretation of our readings from our gamma gauge instrument may be useful to you in connection with our work on the "Special Service" and "Special Service" as are set out on pages 1 and 2 of our report from the "Special Service" and which are to be made available to all our Service Order for this job. The readings must be obtained by the "Special Service" in the drill hole and other conditions unknown to us.

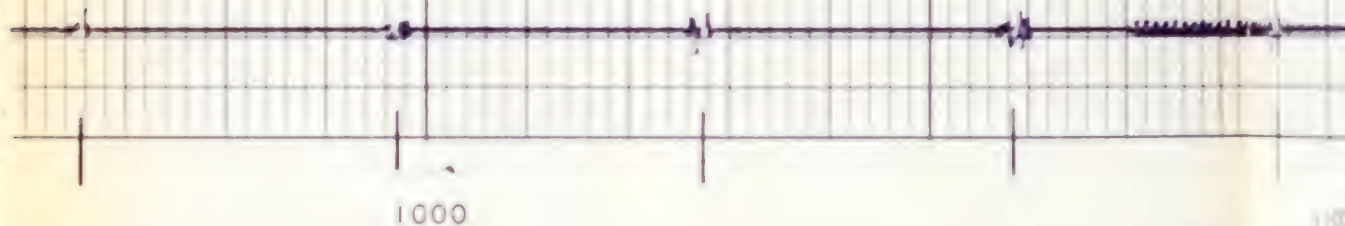
Schlumberger



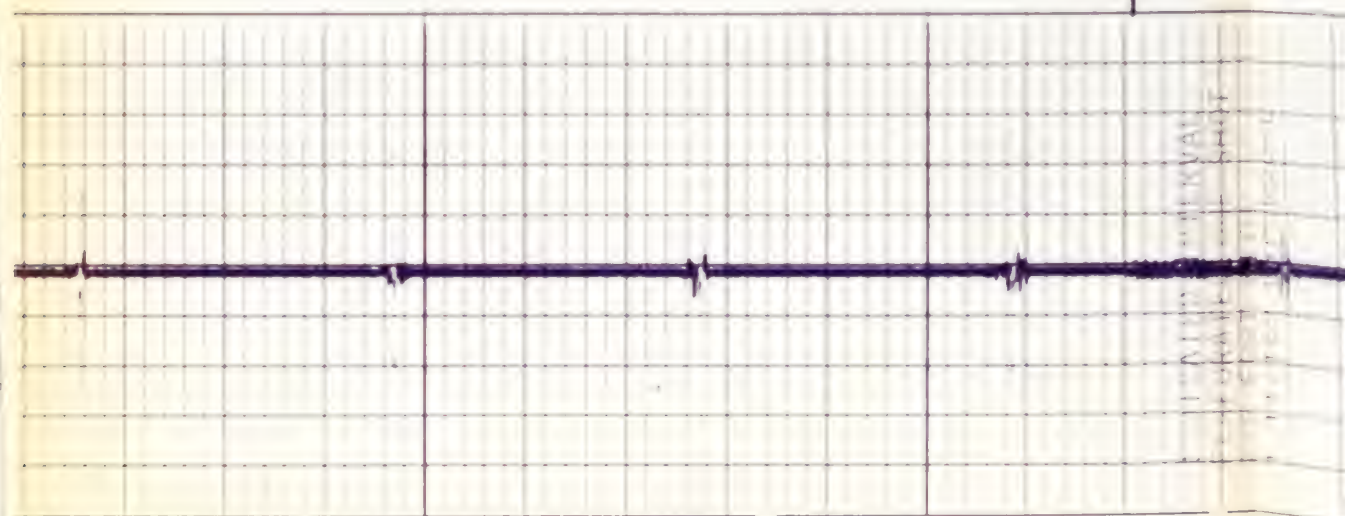


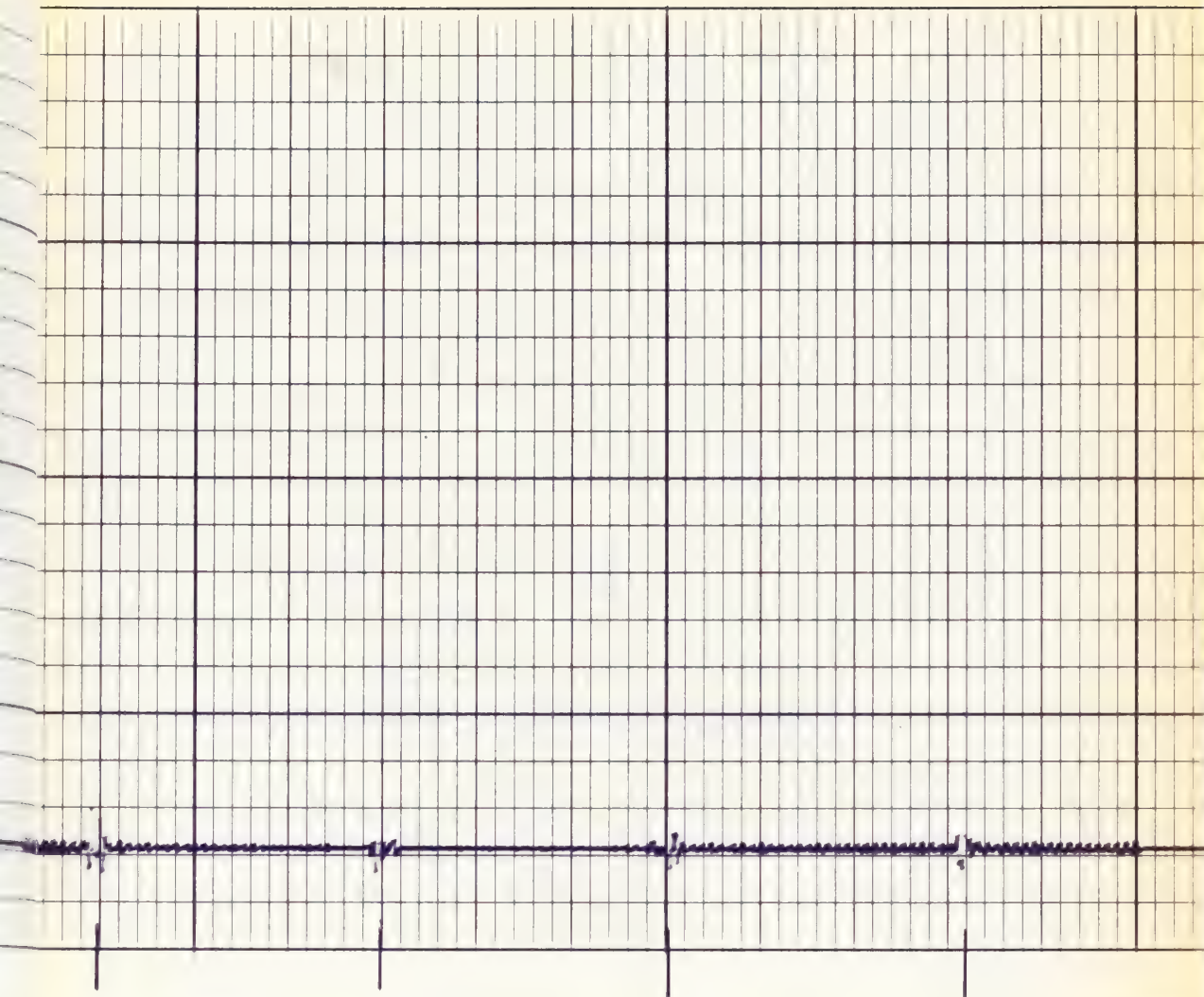
900





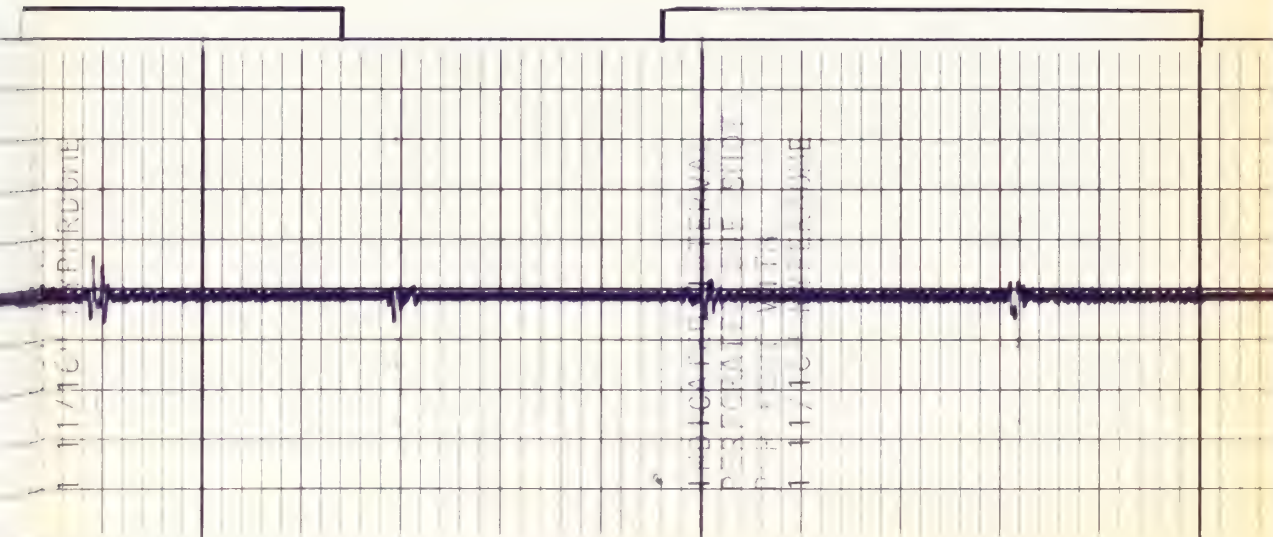
1000





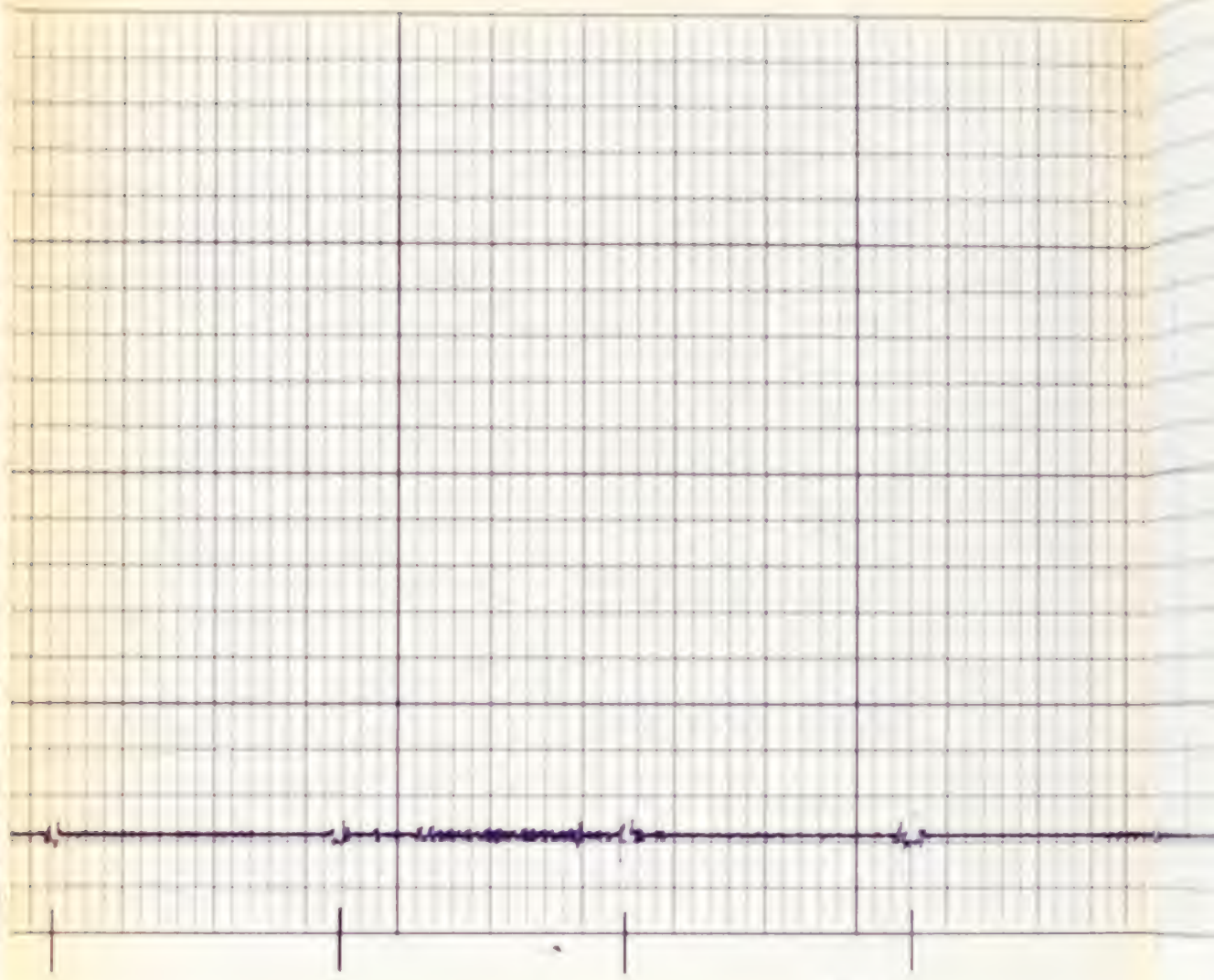
1100

1200

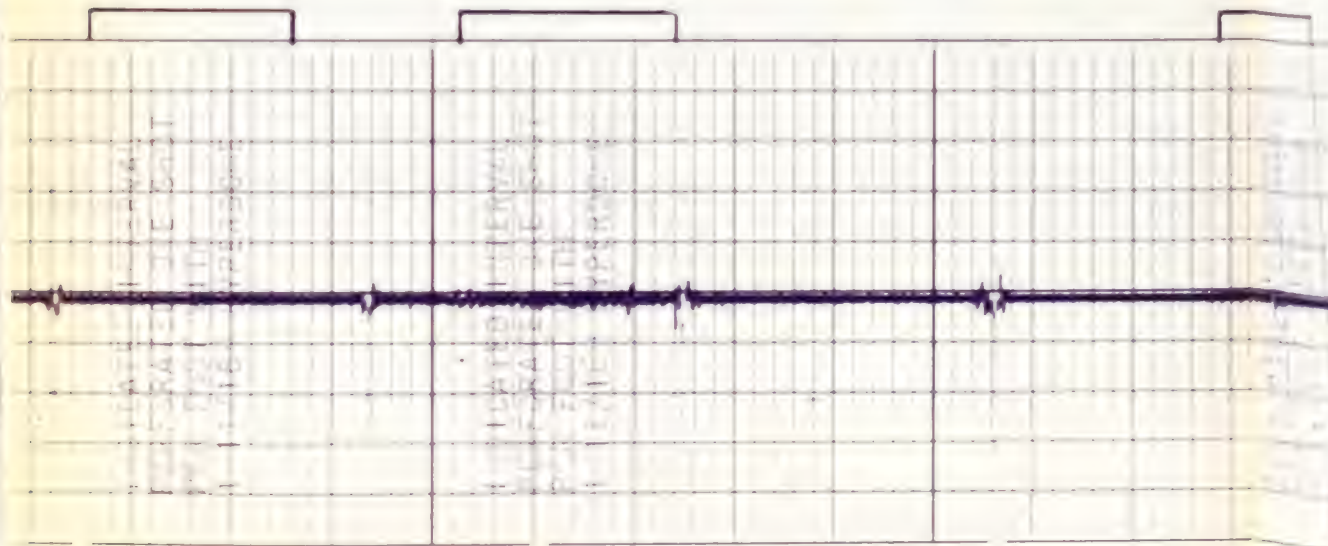


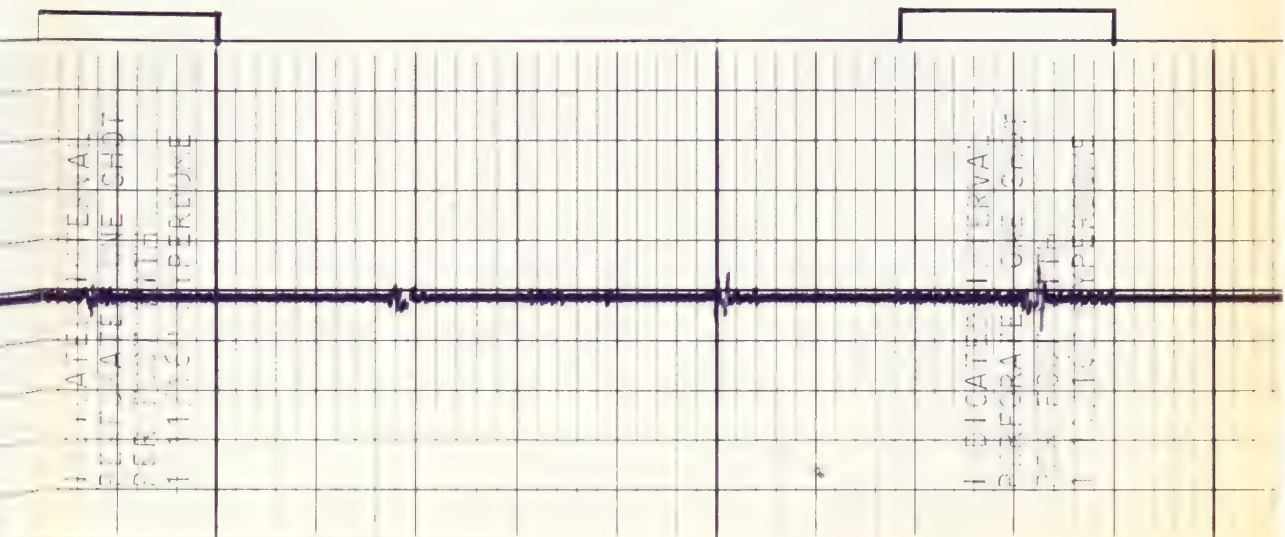
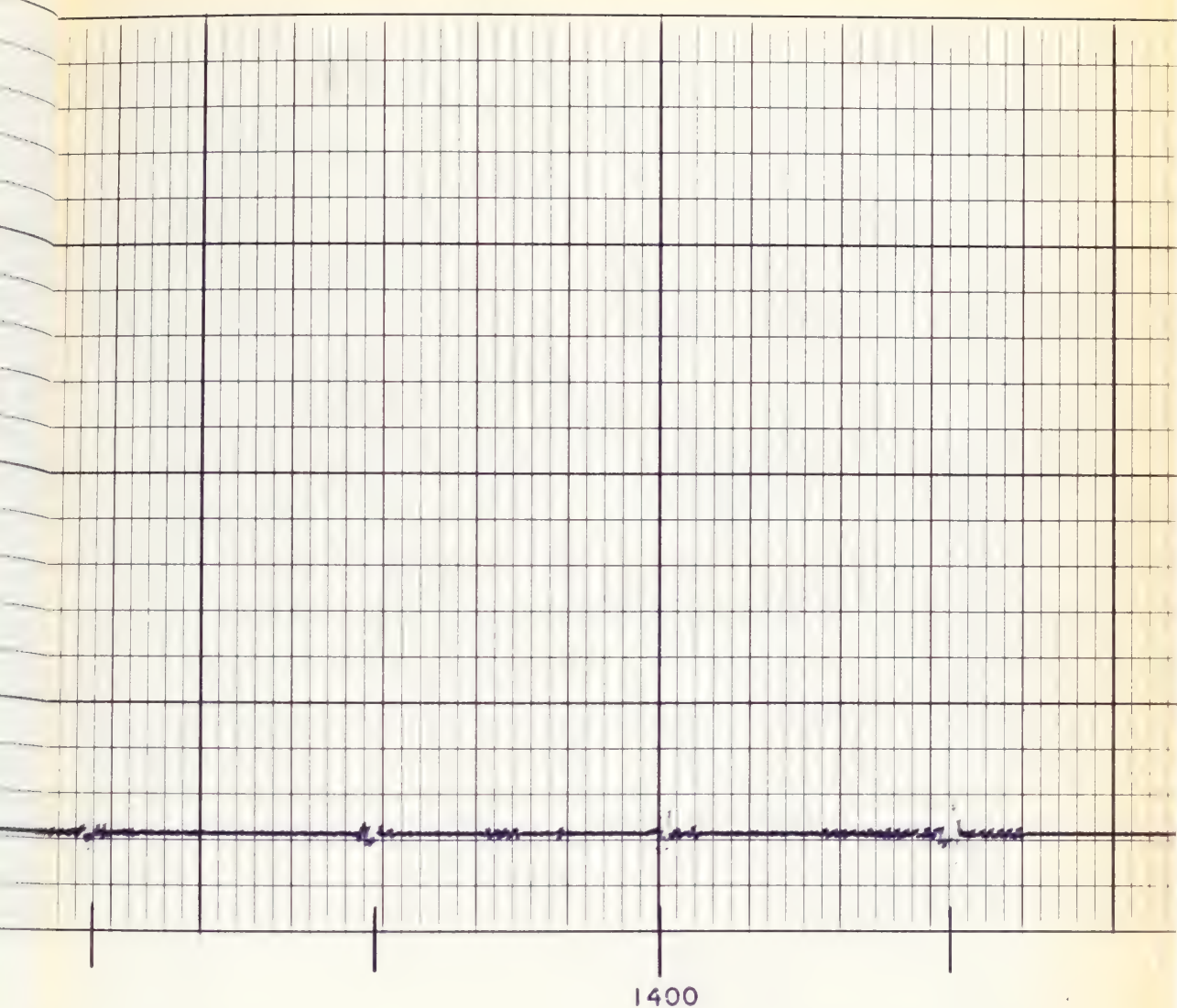
11/10/10 11:00 AM

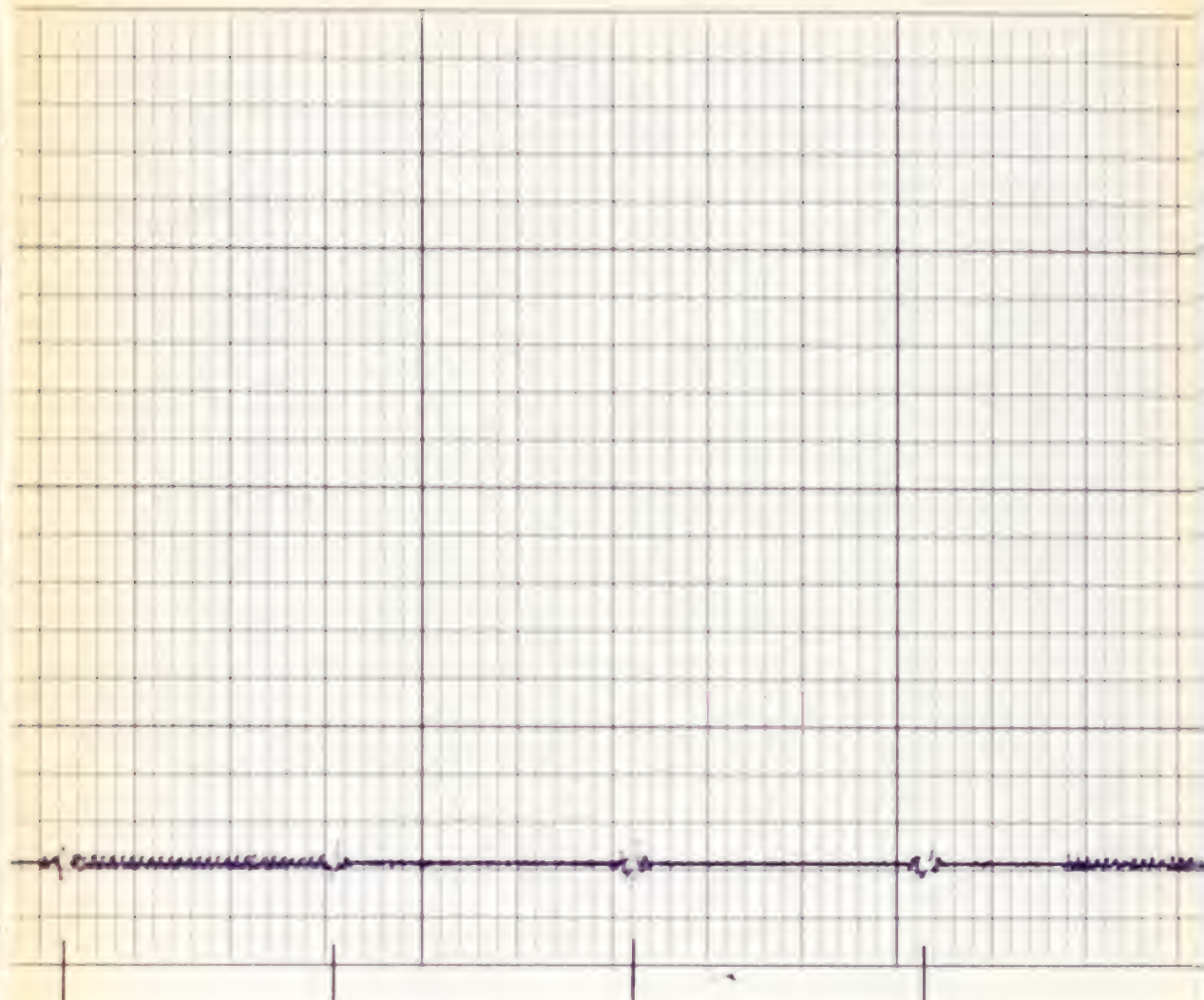
11/10/10 11:00 AM
PERICARDIAL EFFUSION
11/10/10 11:00 AM



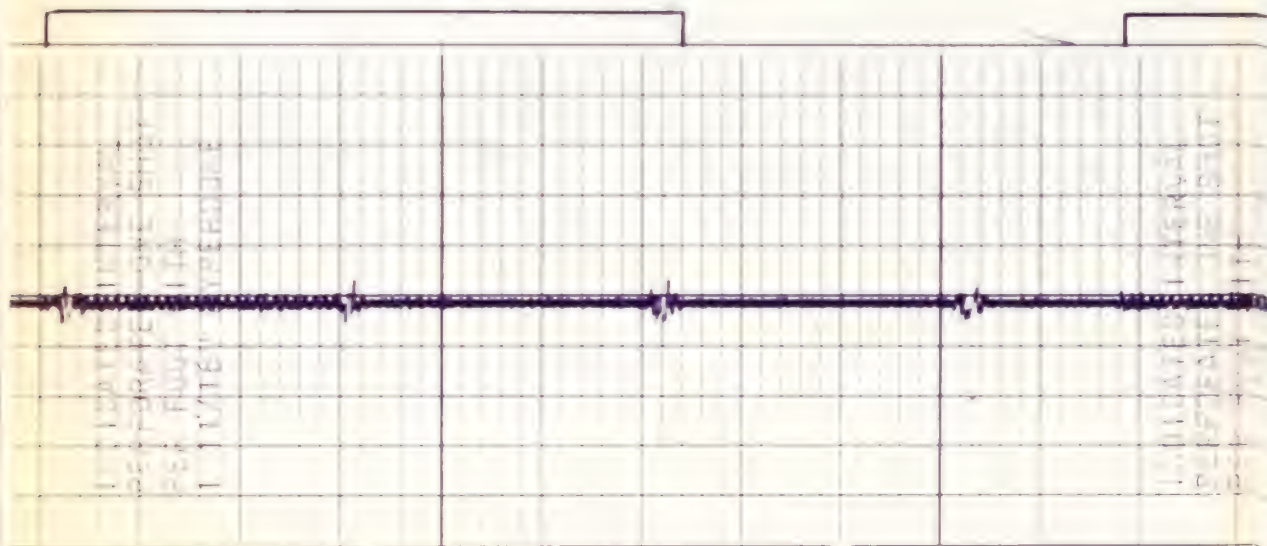
1300





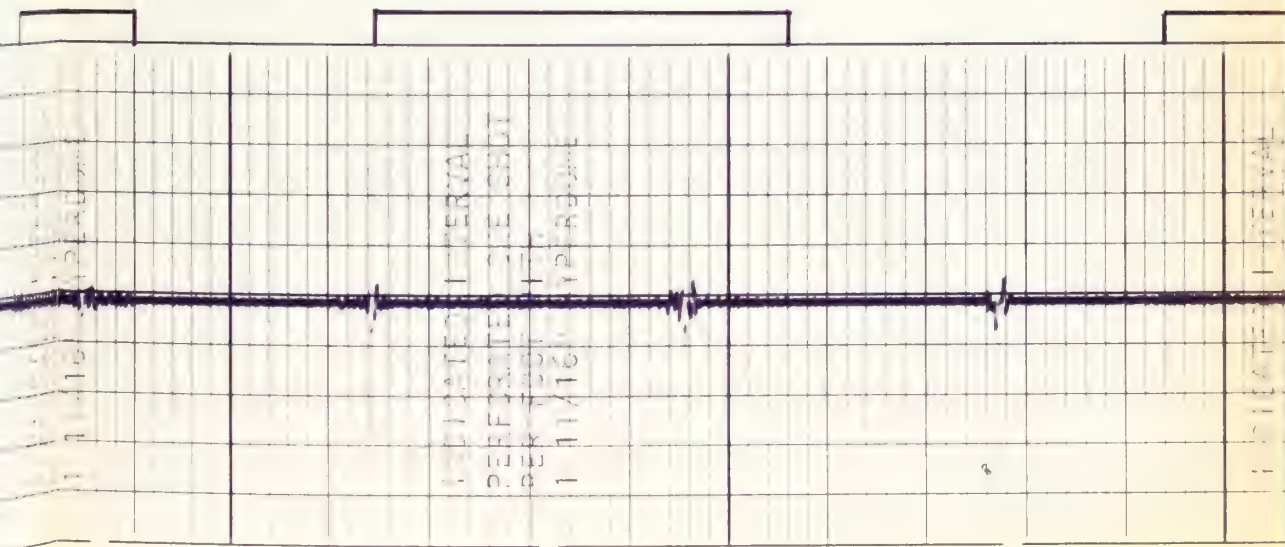
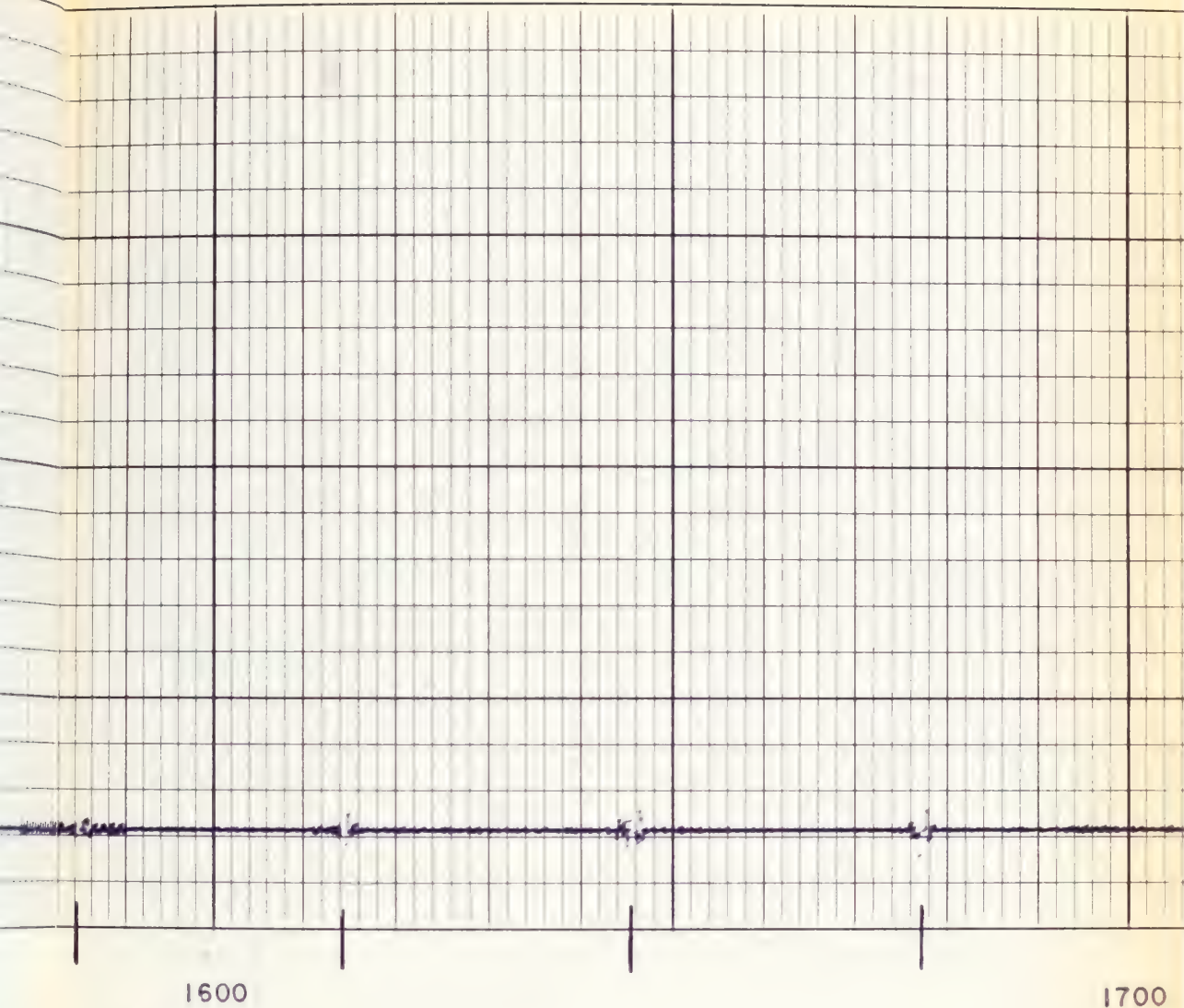


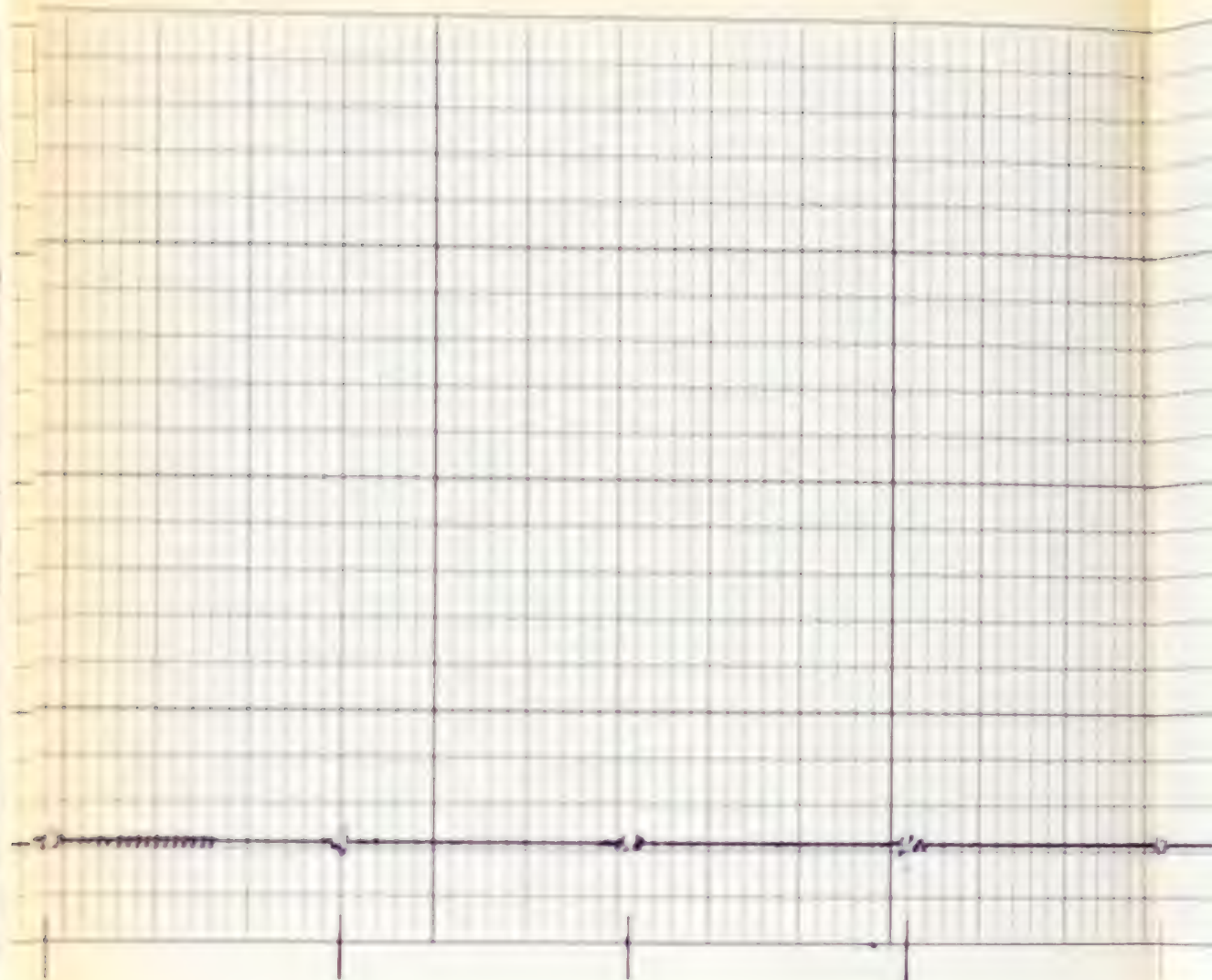
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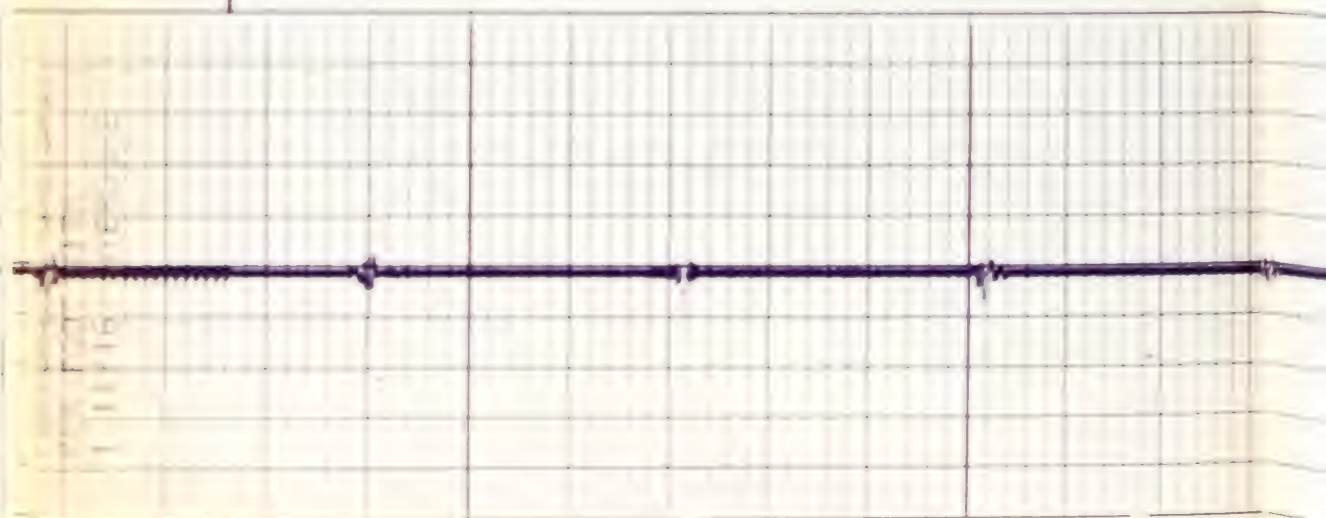
UNITED STATES
DEPARTMENT OF THE ARMY
PER. FILED
1 1/16 1978

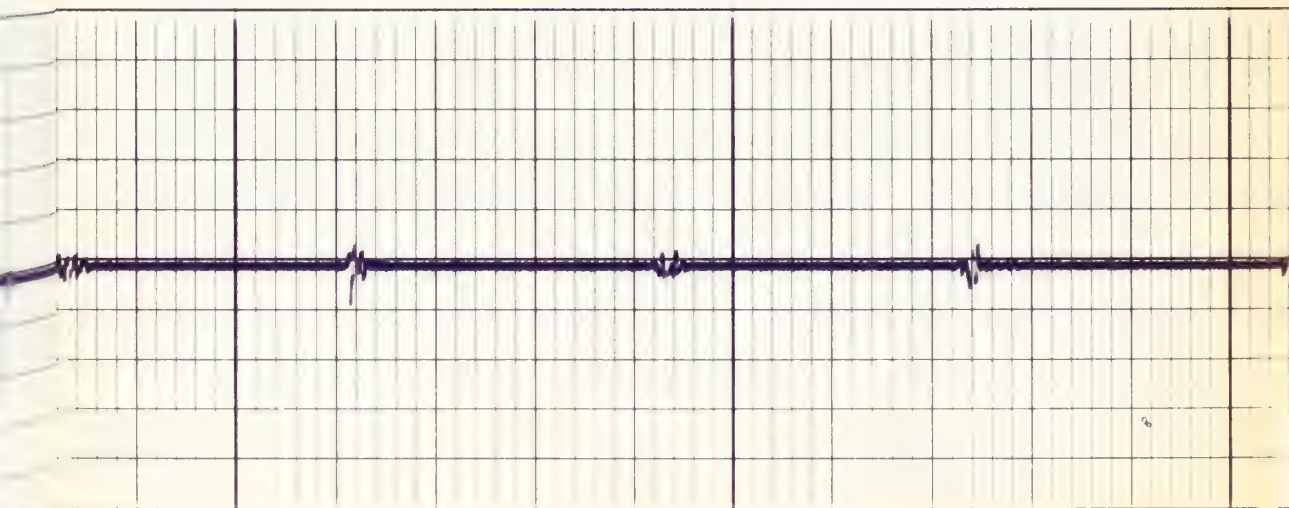
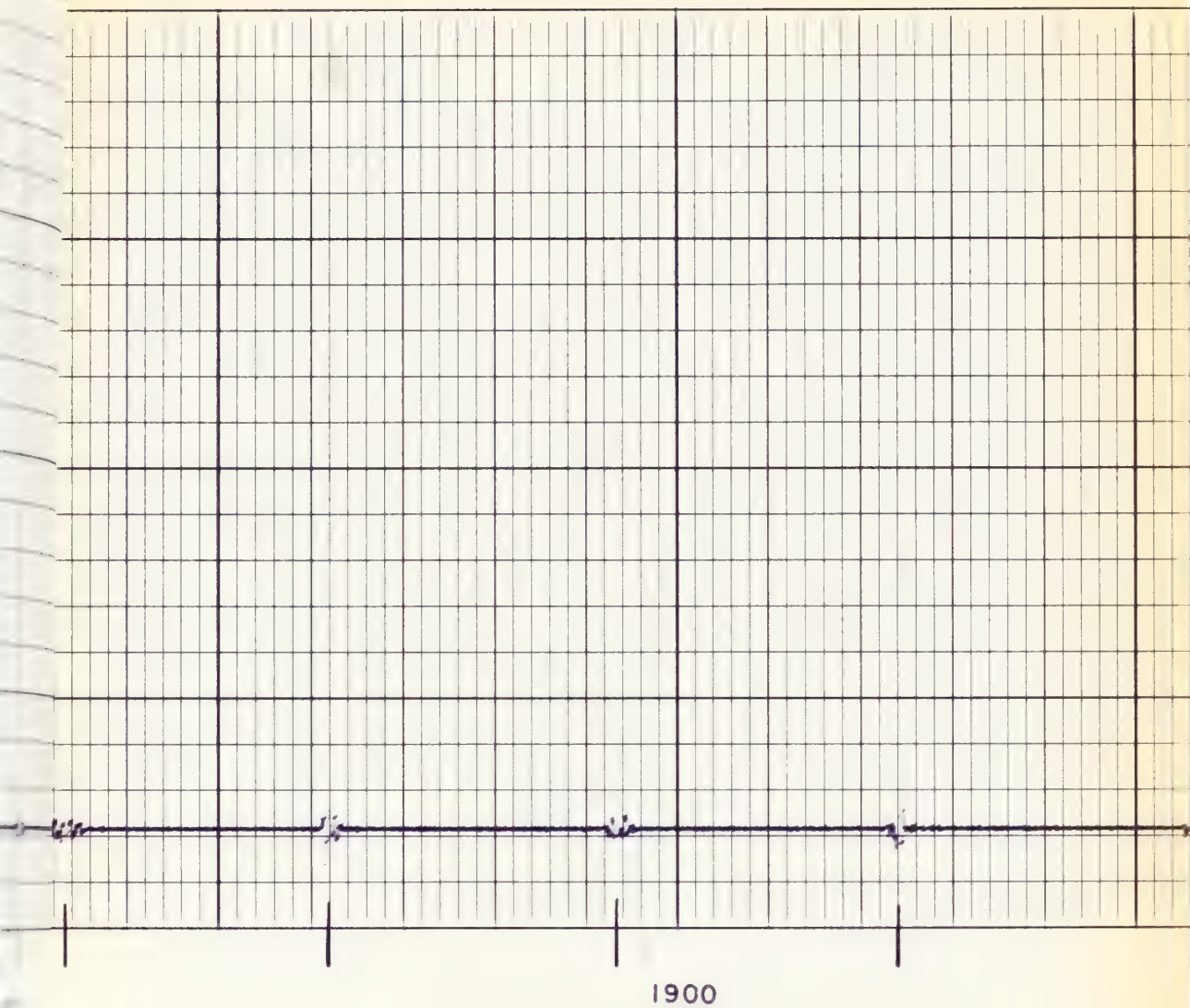
UNITED STATES
DEPARTMENT OF THE ARMY
PER. FILED
1 1/16 1978

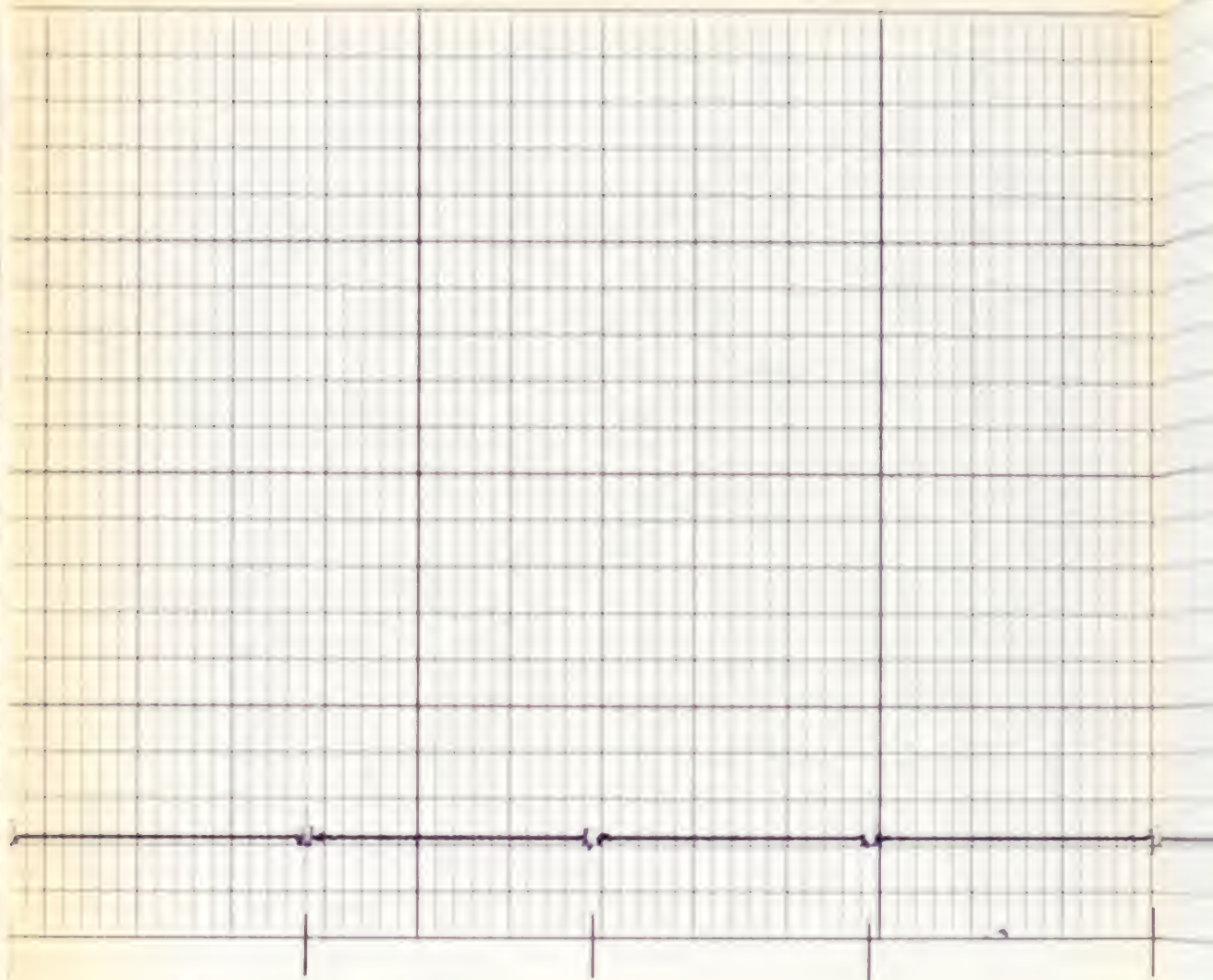




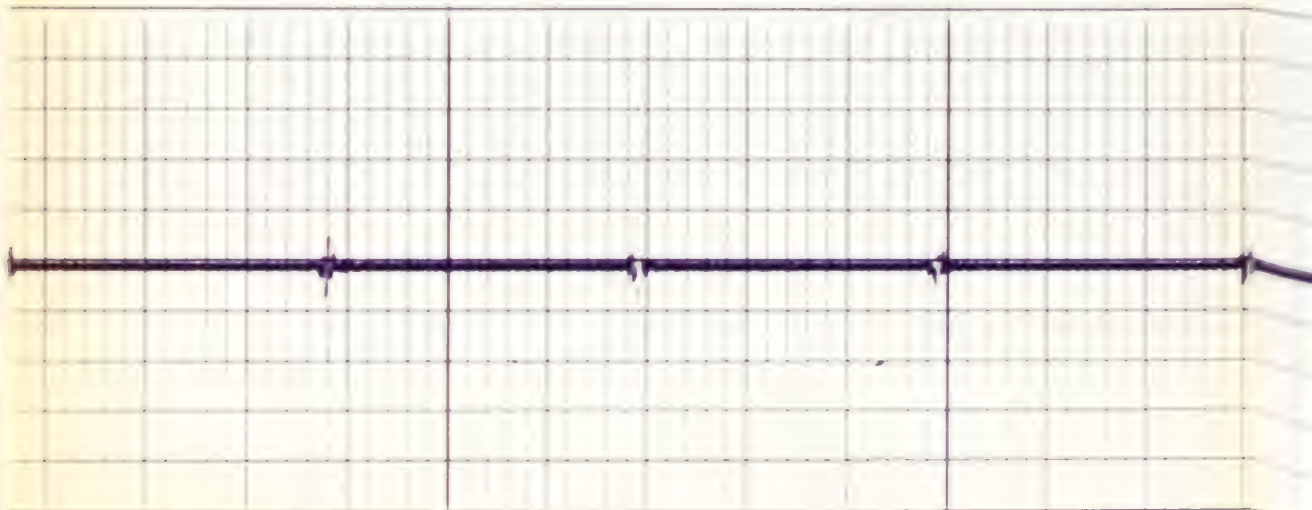
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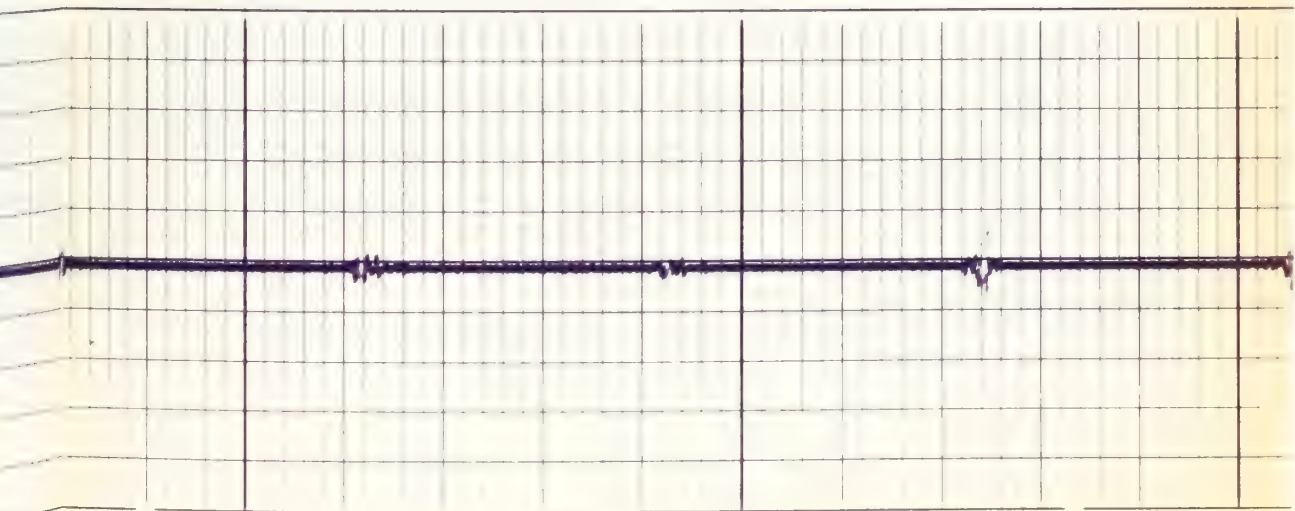
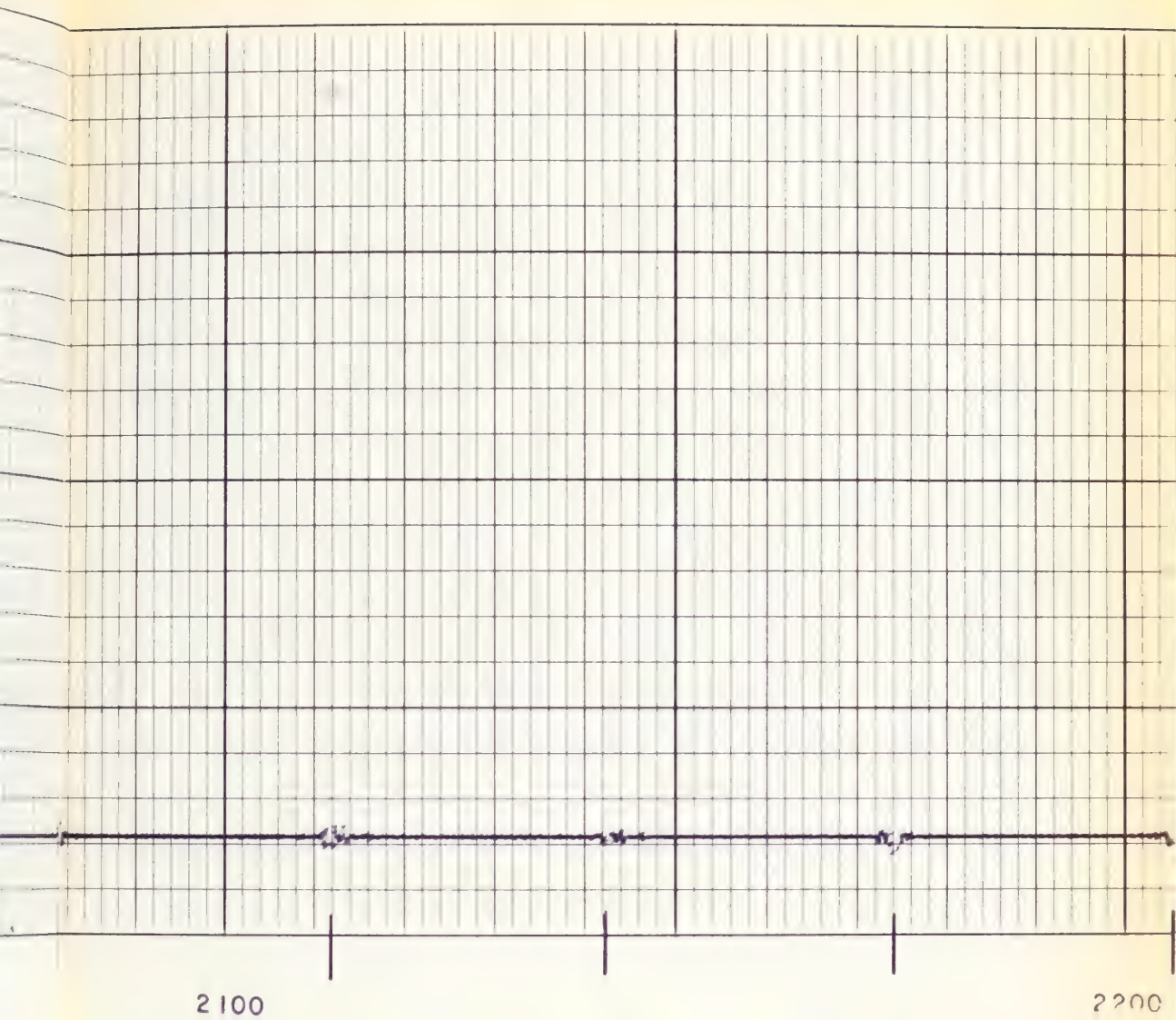


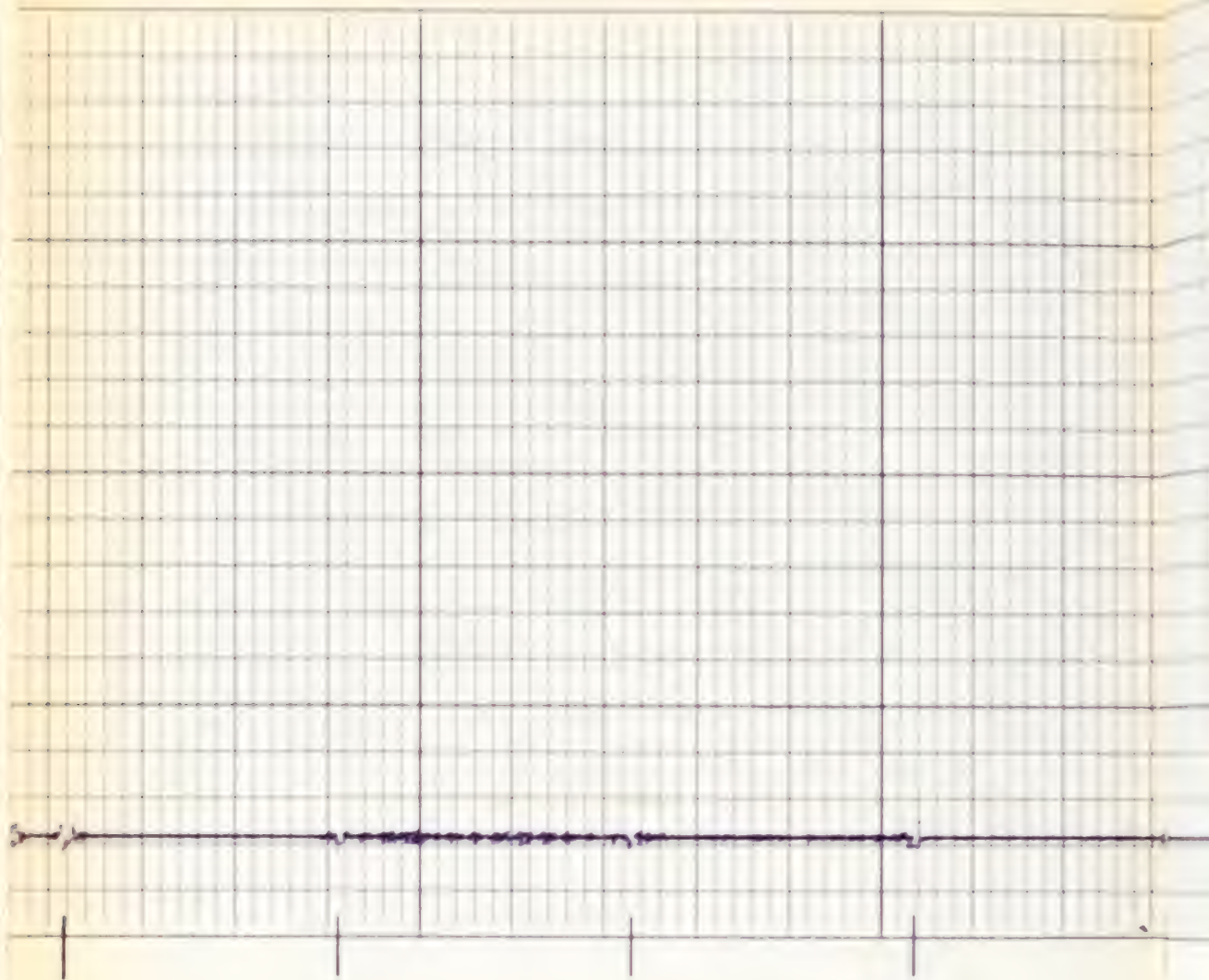




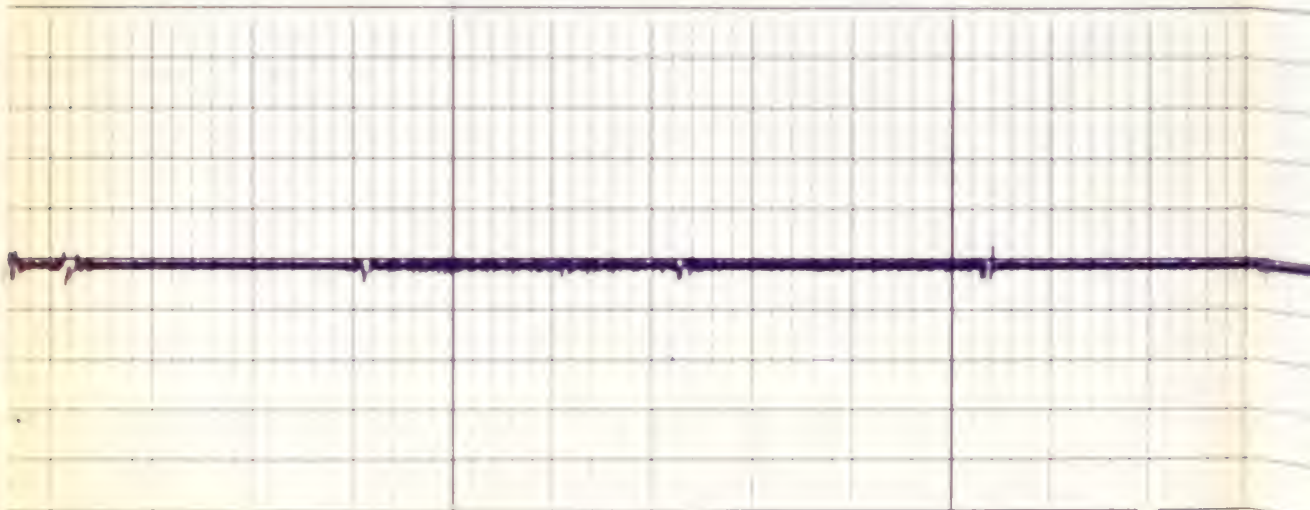
2000

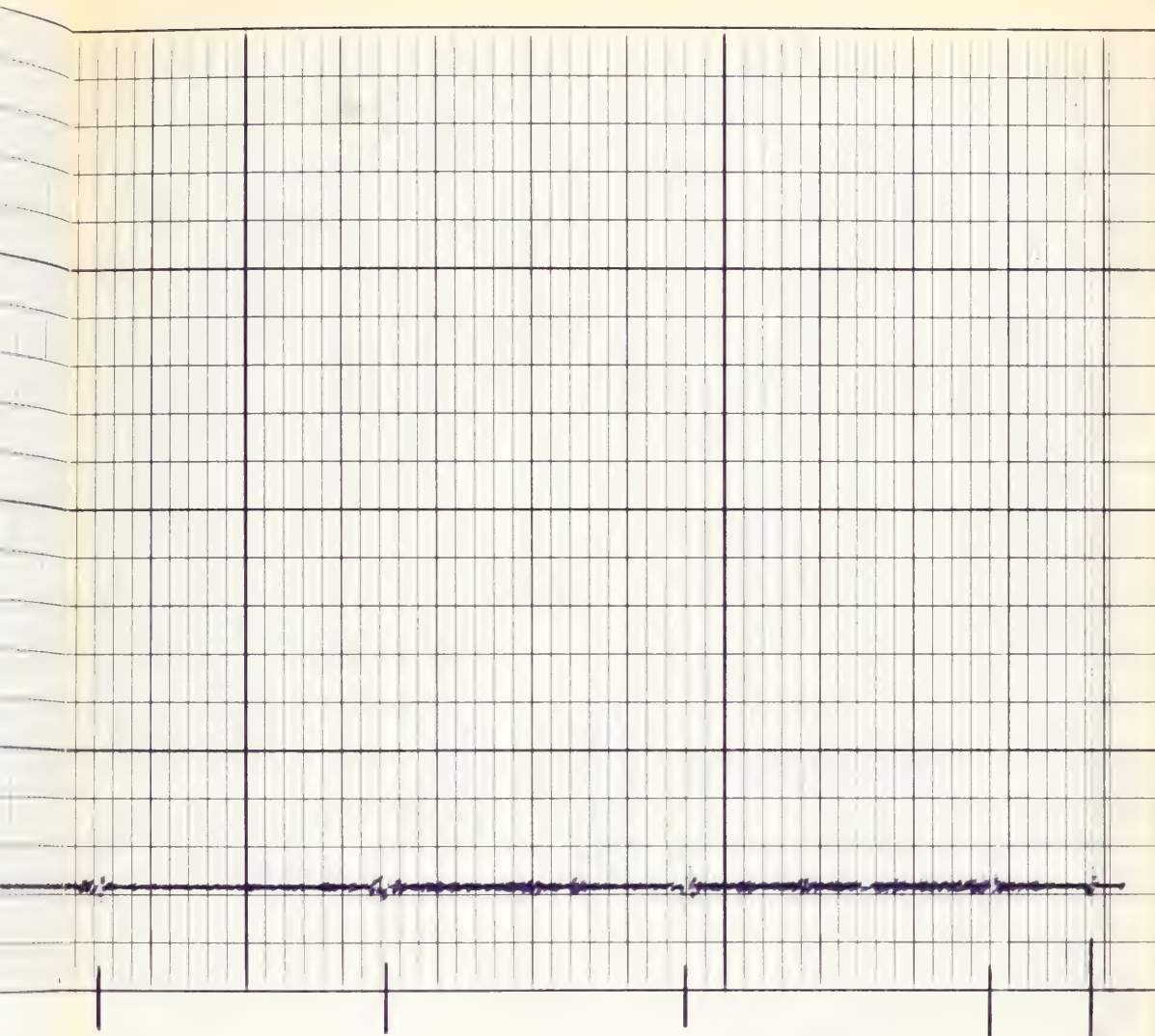




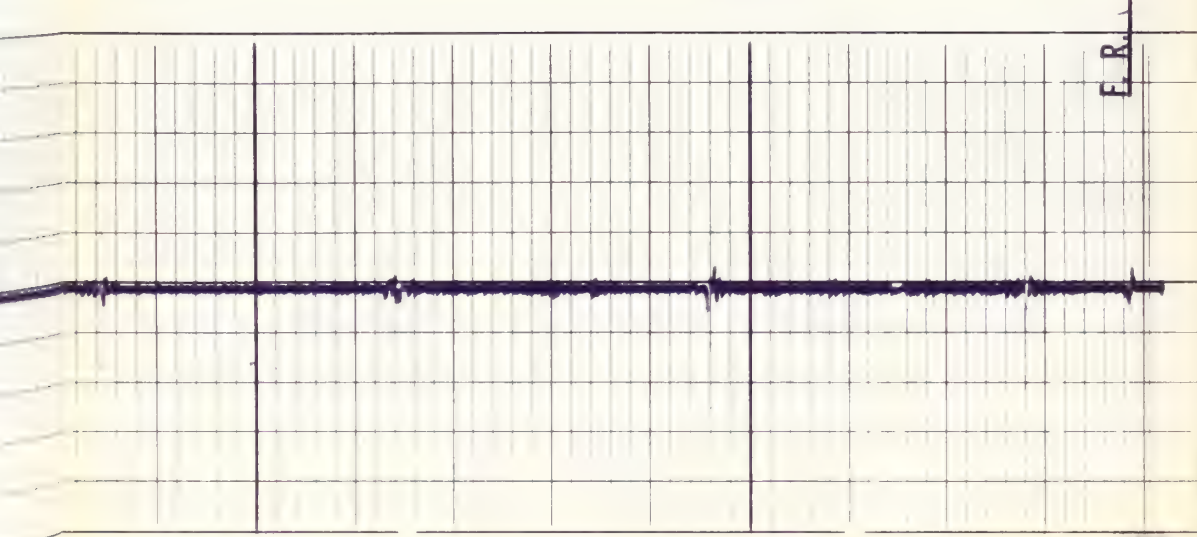


2300



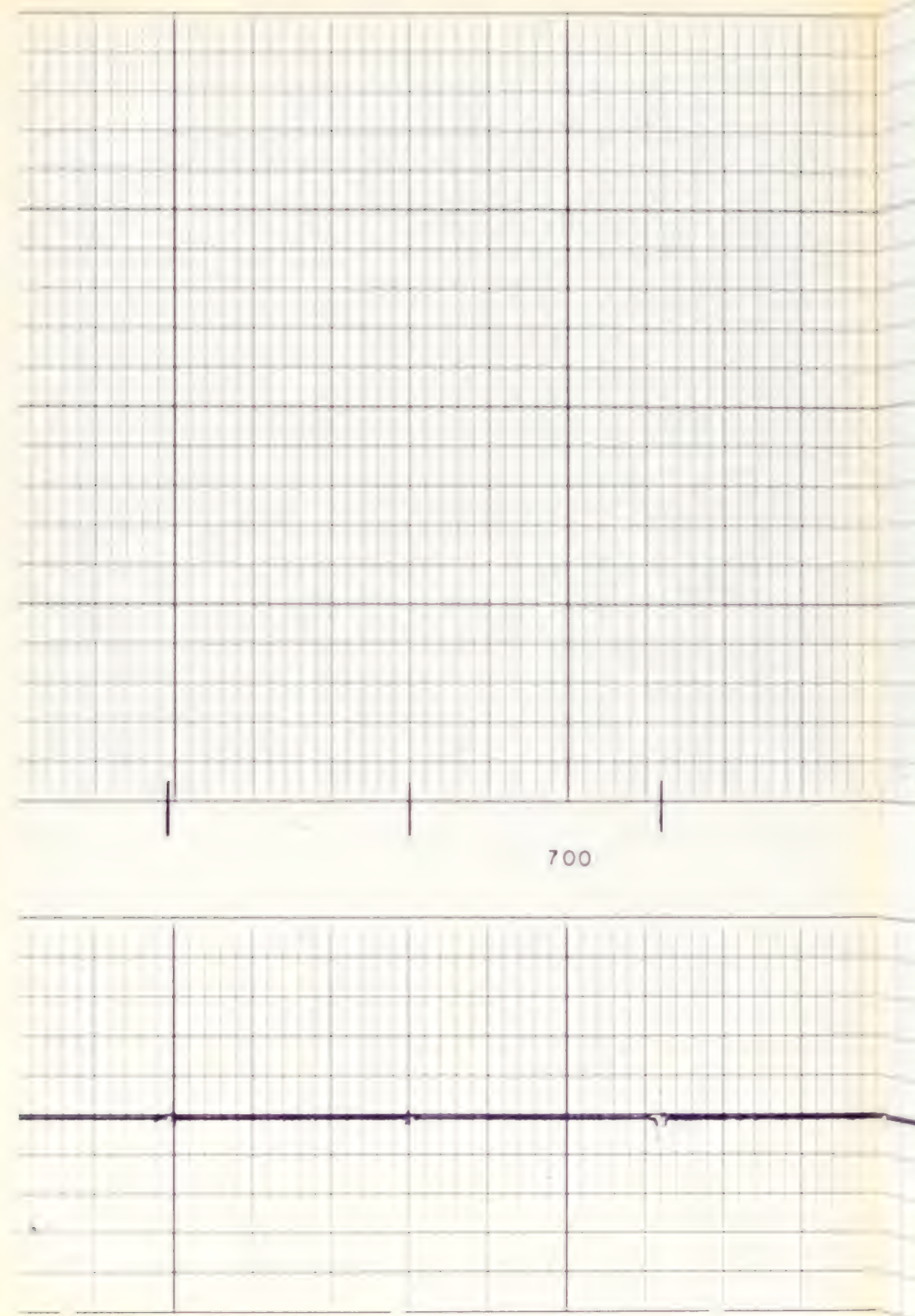


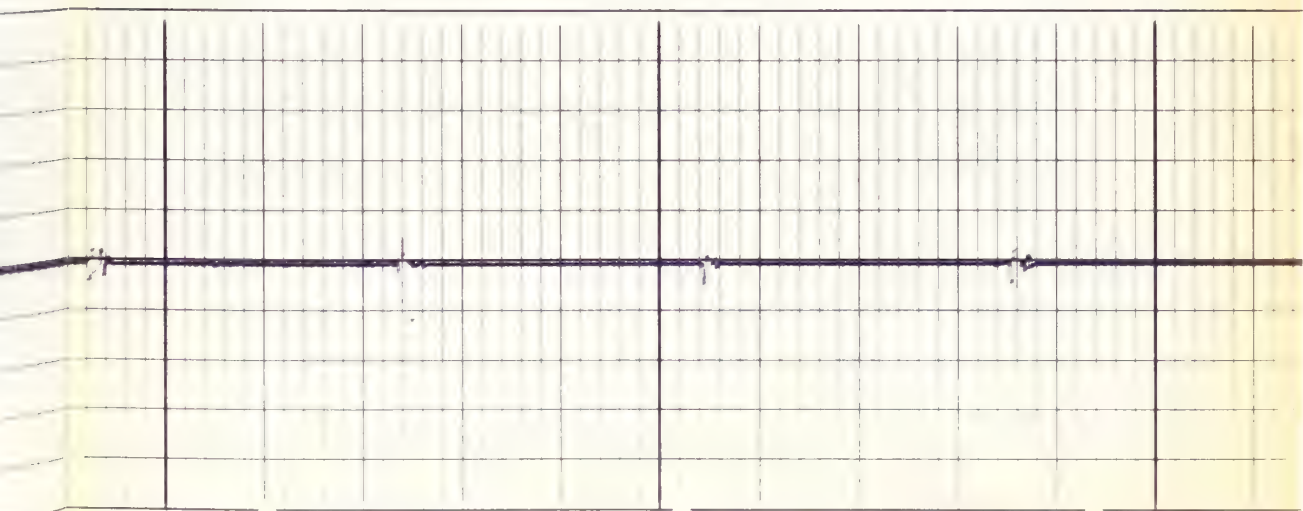
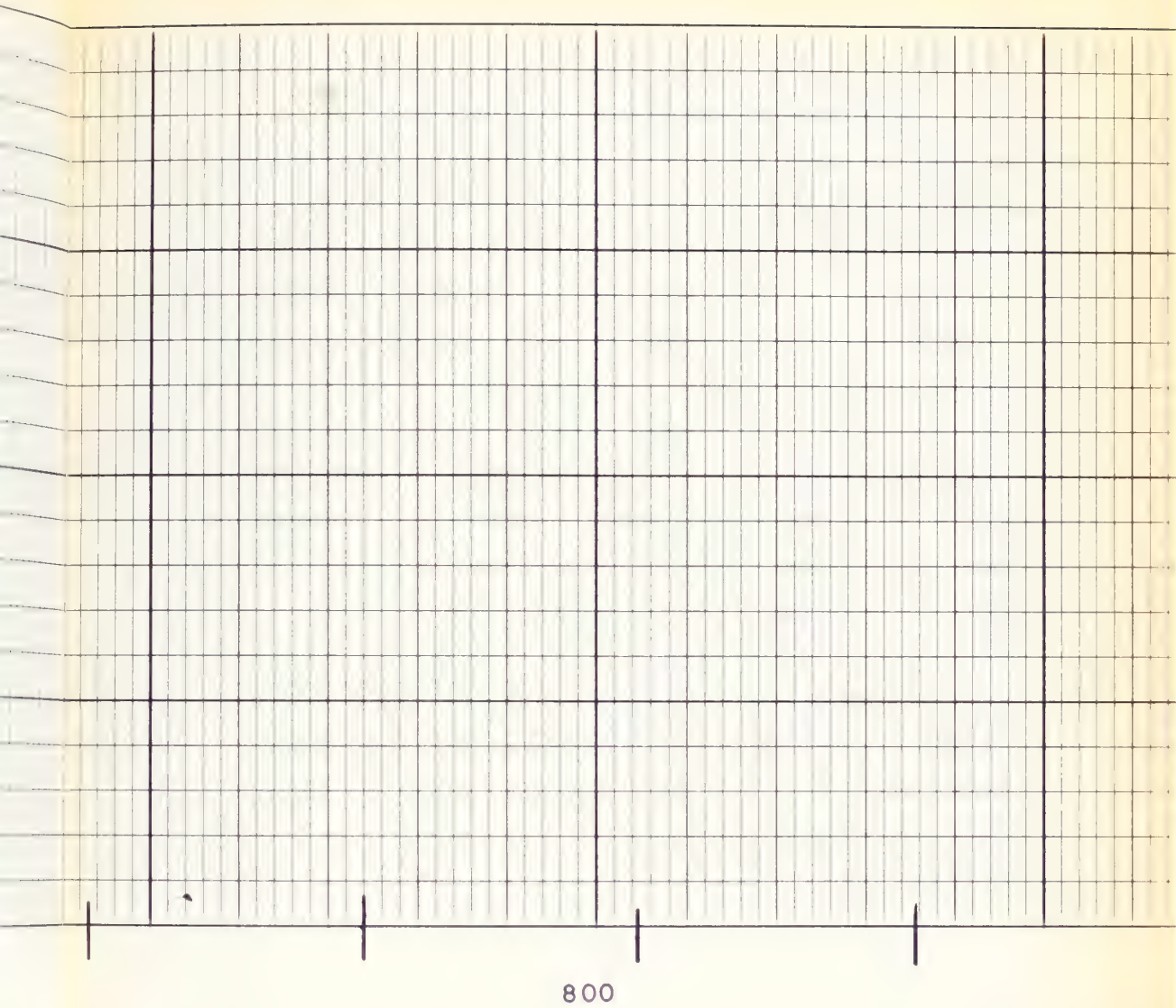
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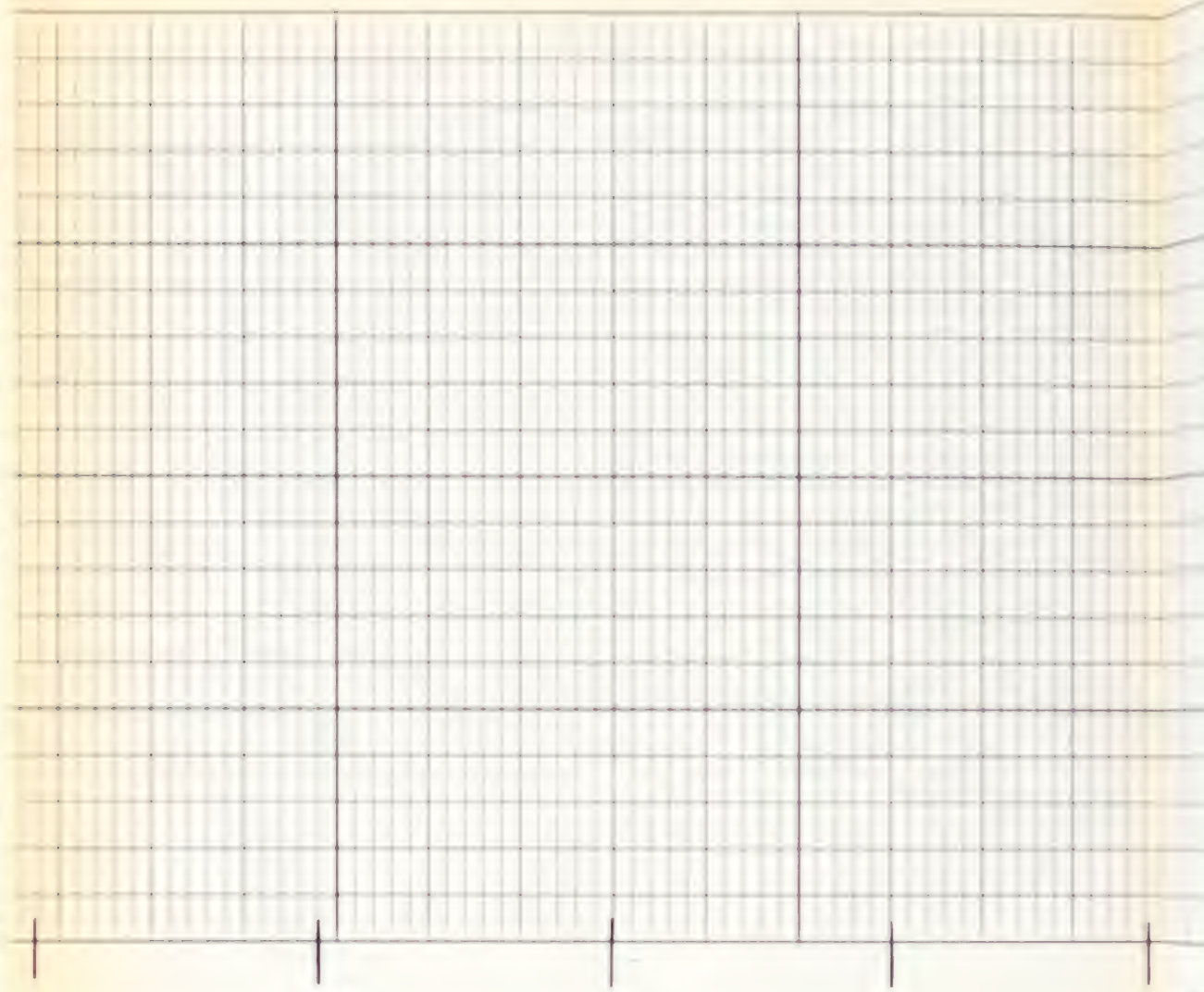


E.R.

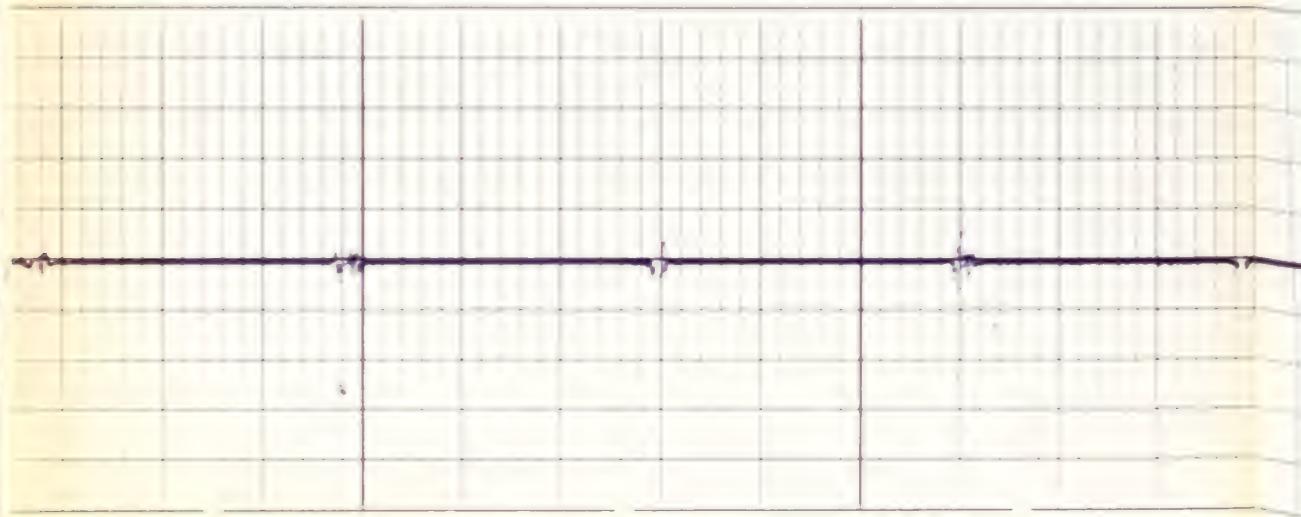
CELLULOSE 20% (W/V) - 10% (W/V) - 10% (W/V)

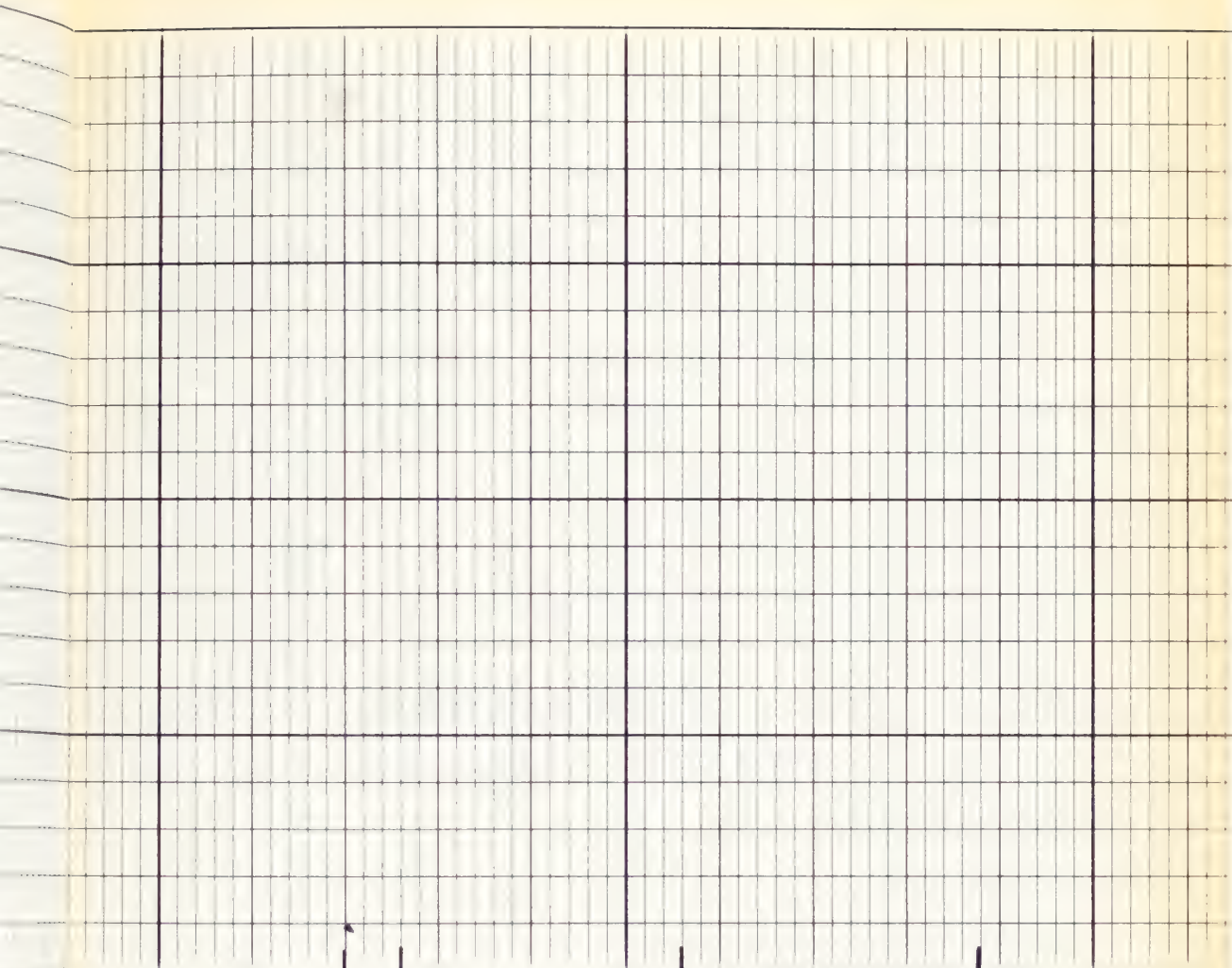






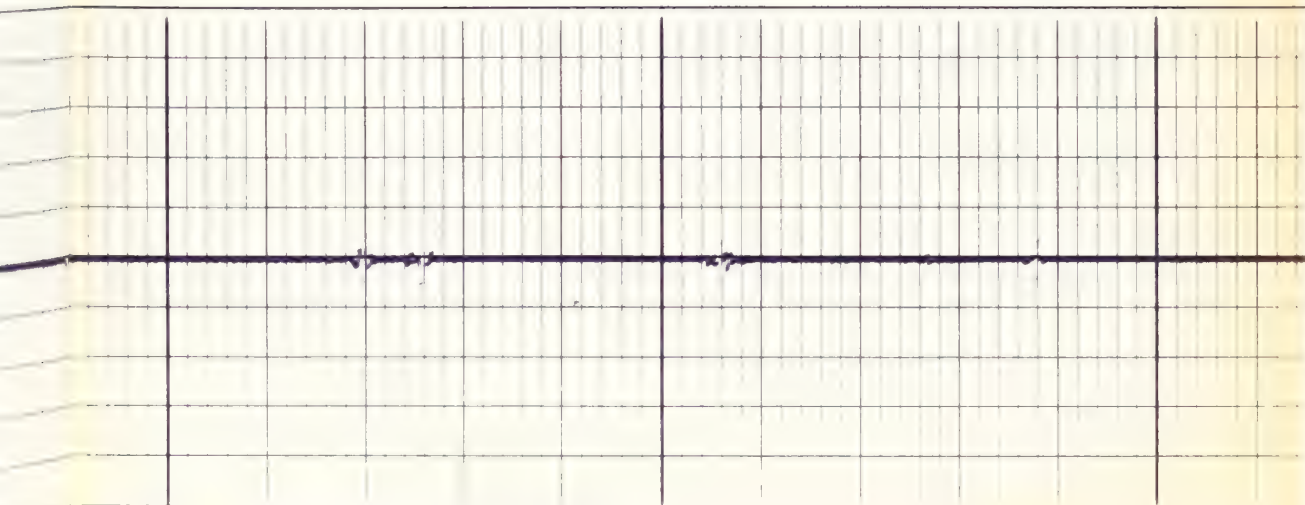
900





1000

1100



RADIO-ORIENTATION

INDEXING

1200

E.R.

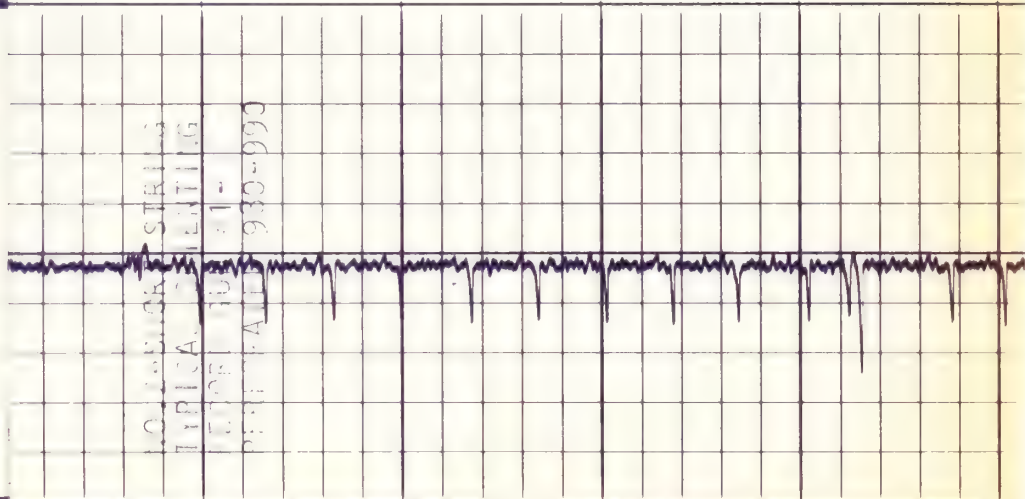
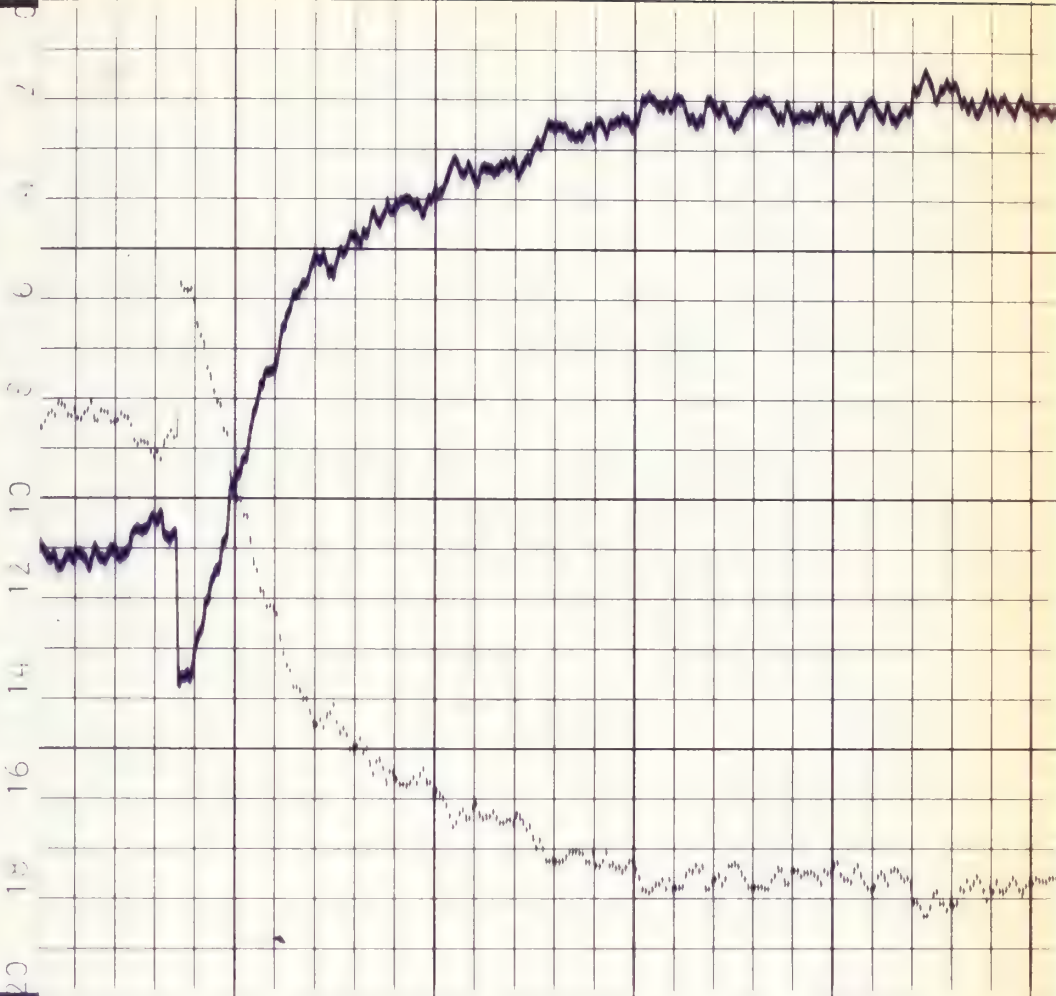
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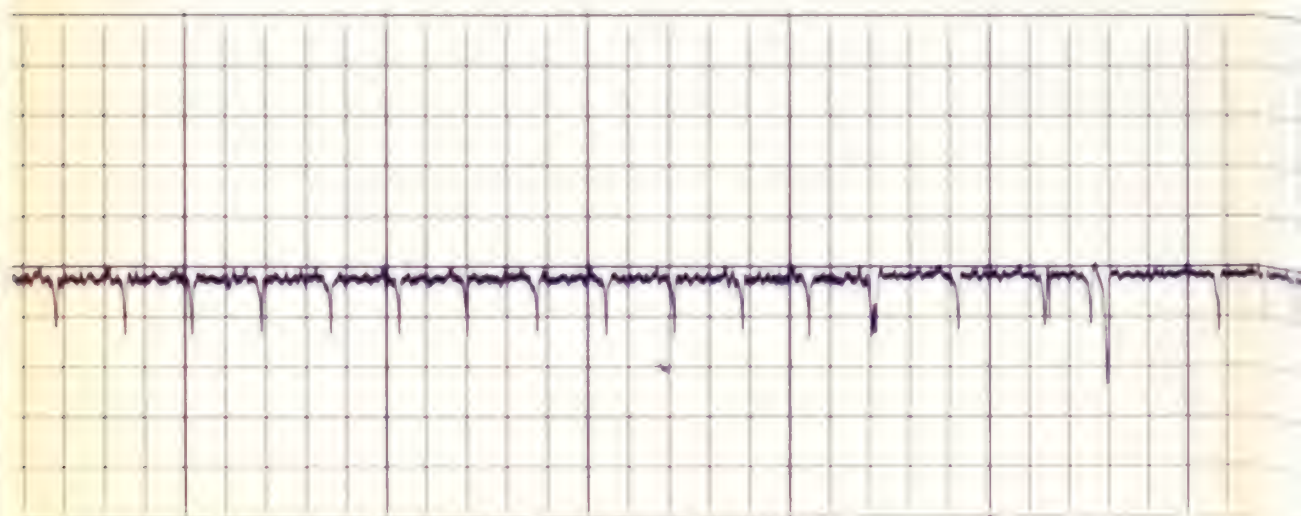
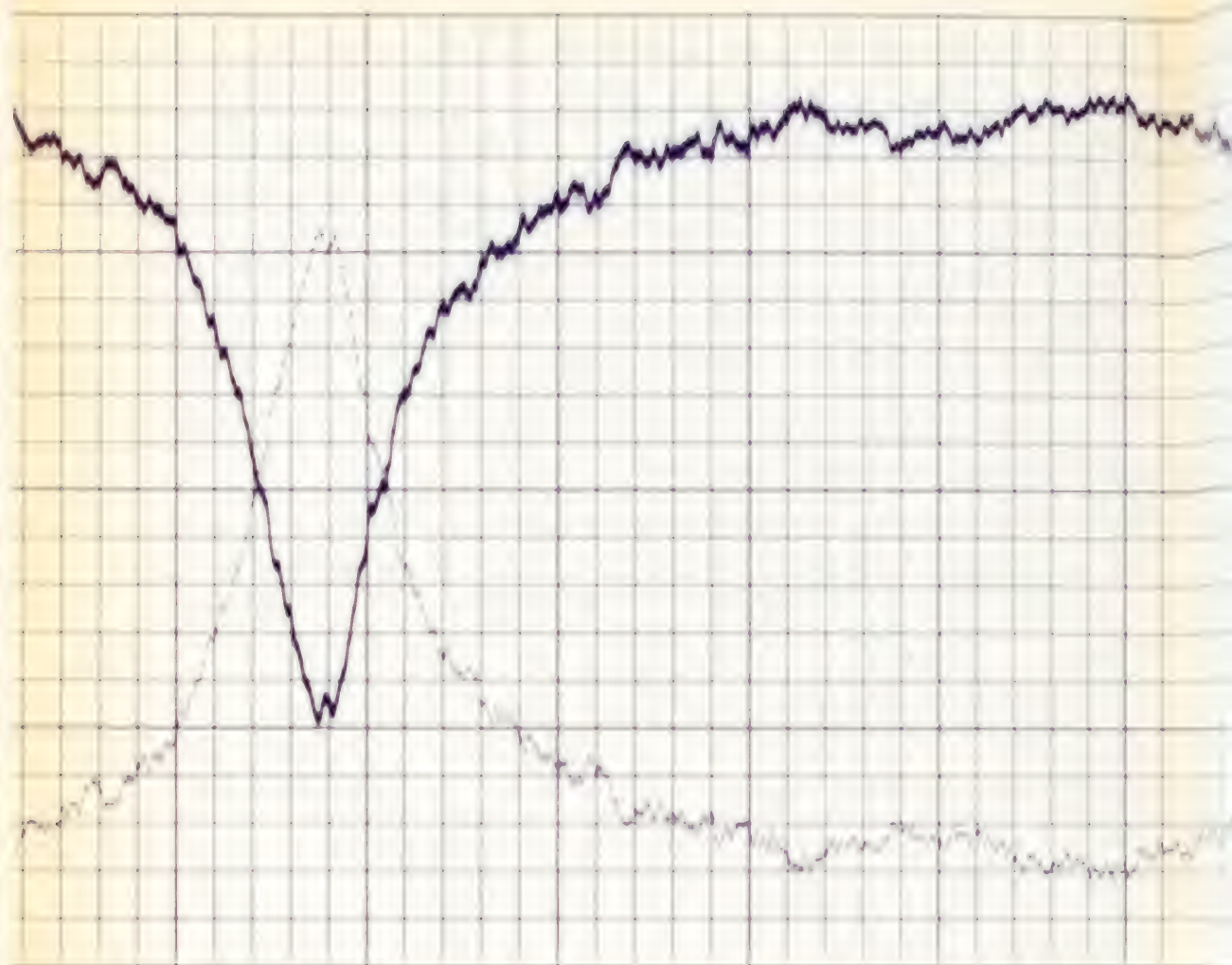
TO ORDER STRIP
TYPICAL
TYPICAL
TYPICAL

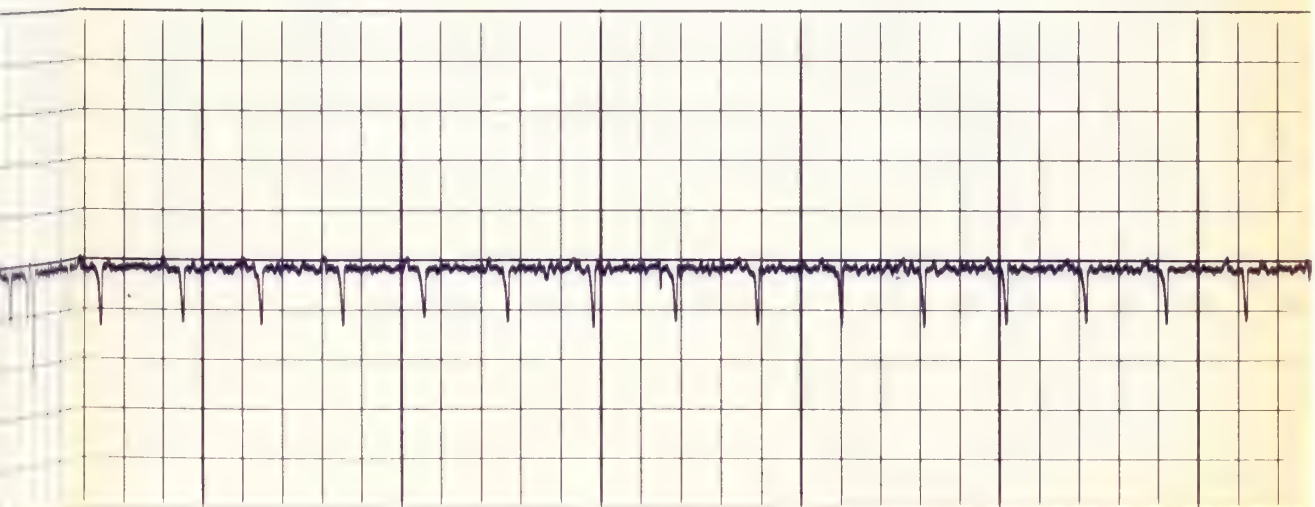
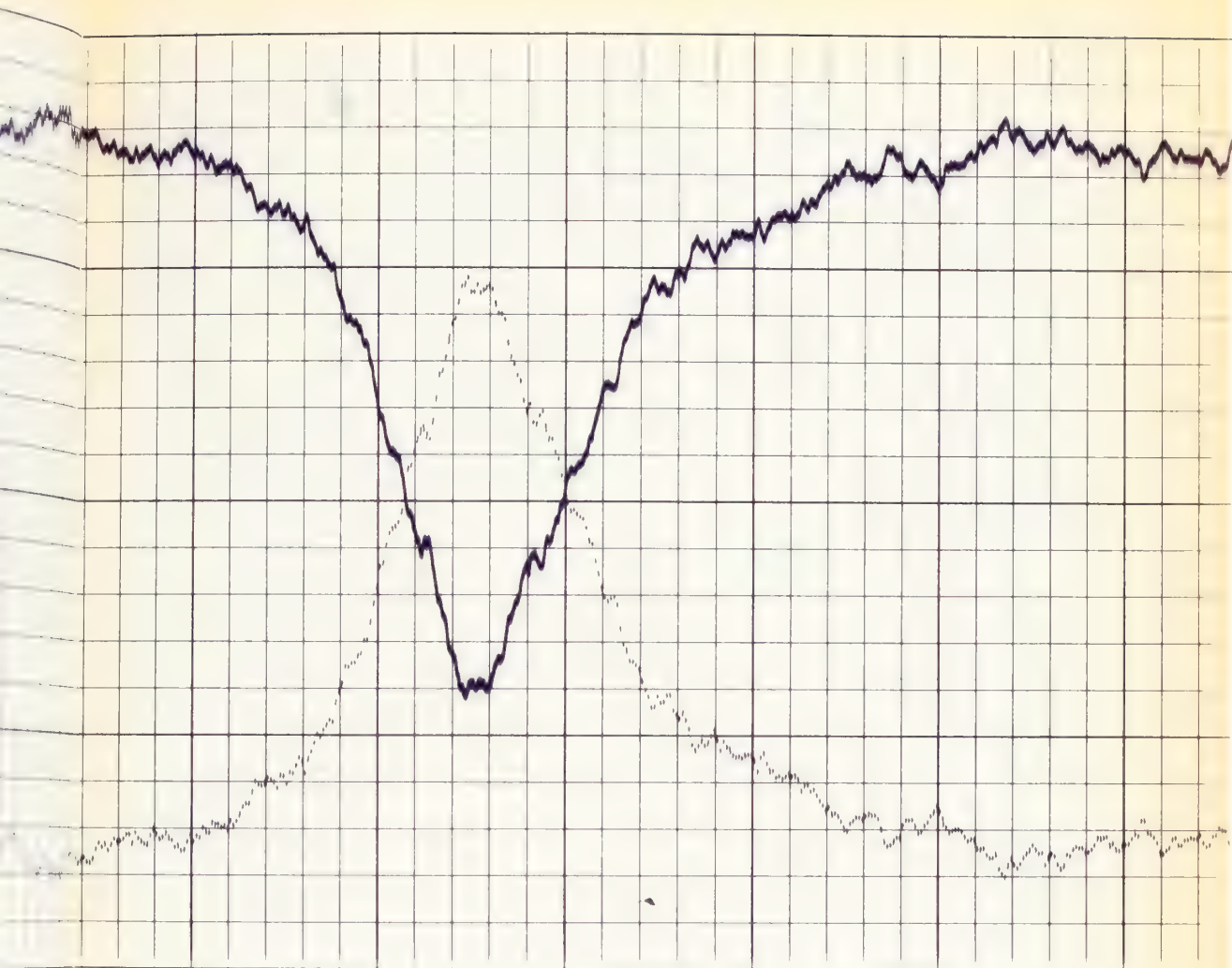
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COUNTS INCREASE

COUNTS INCREASE

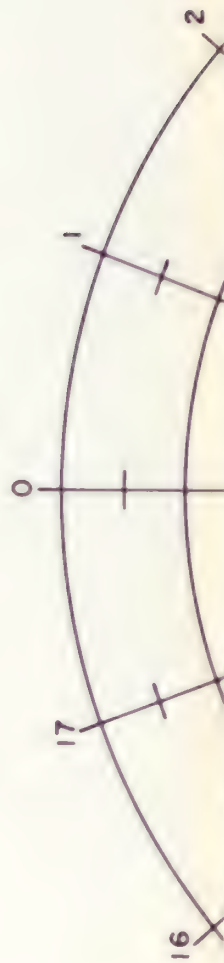




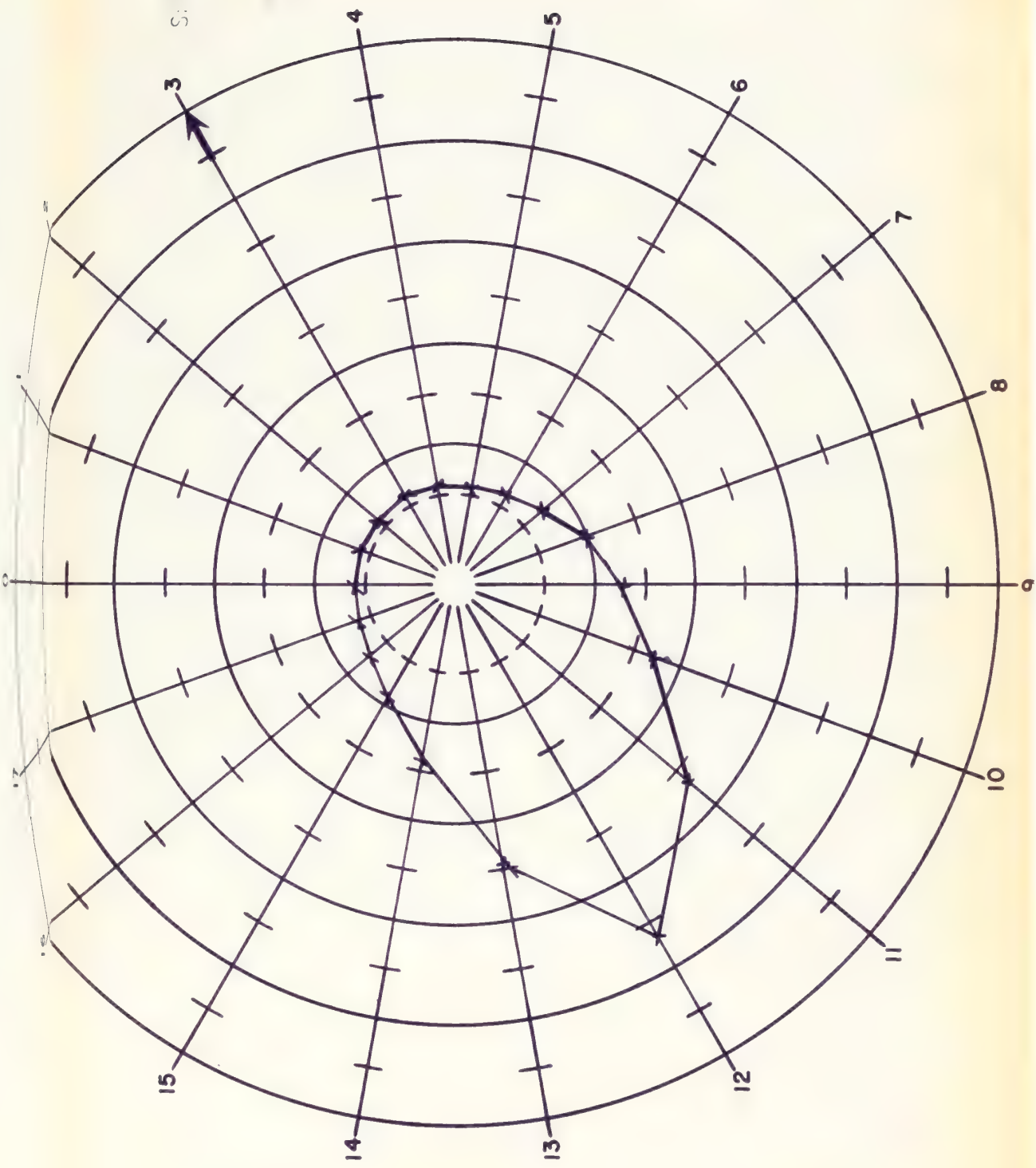


RADIO-ORIENTATION PLOT

POT-8



S: 070

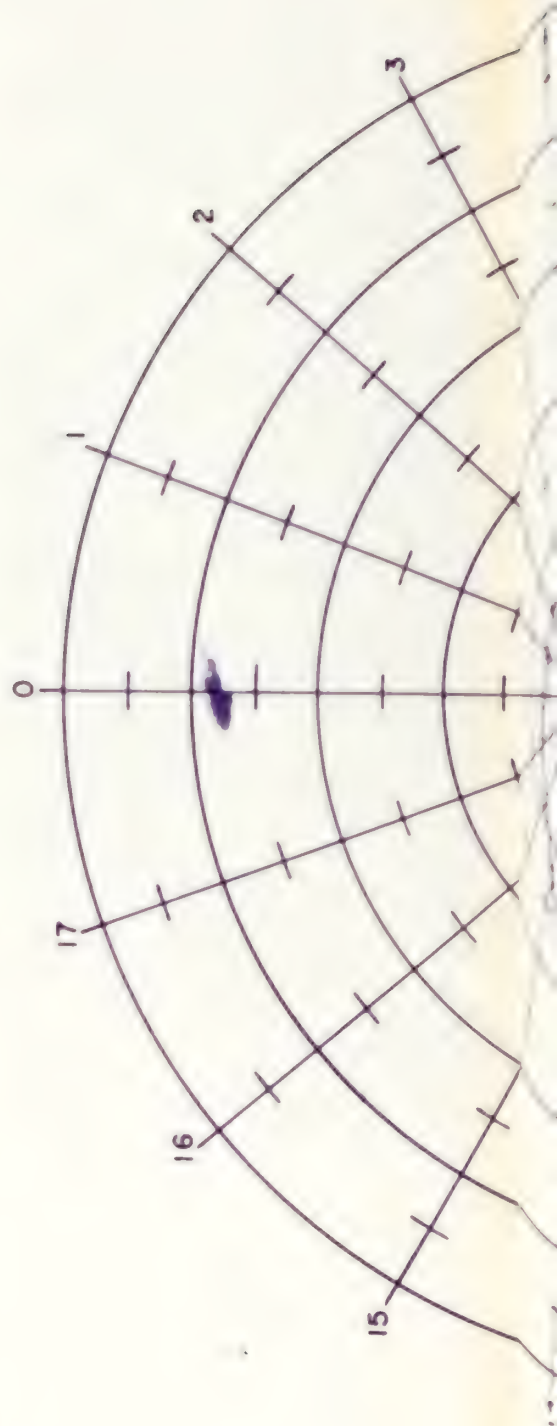


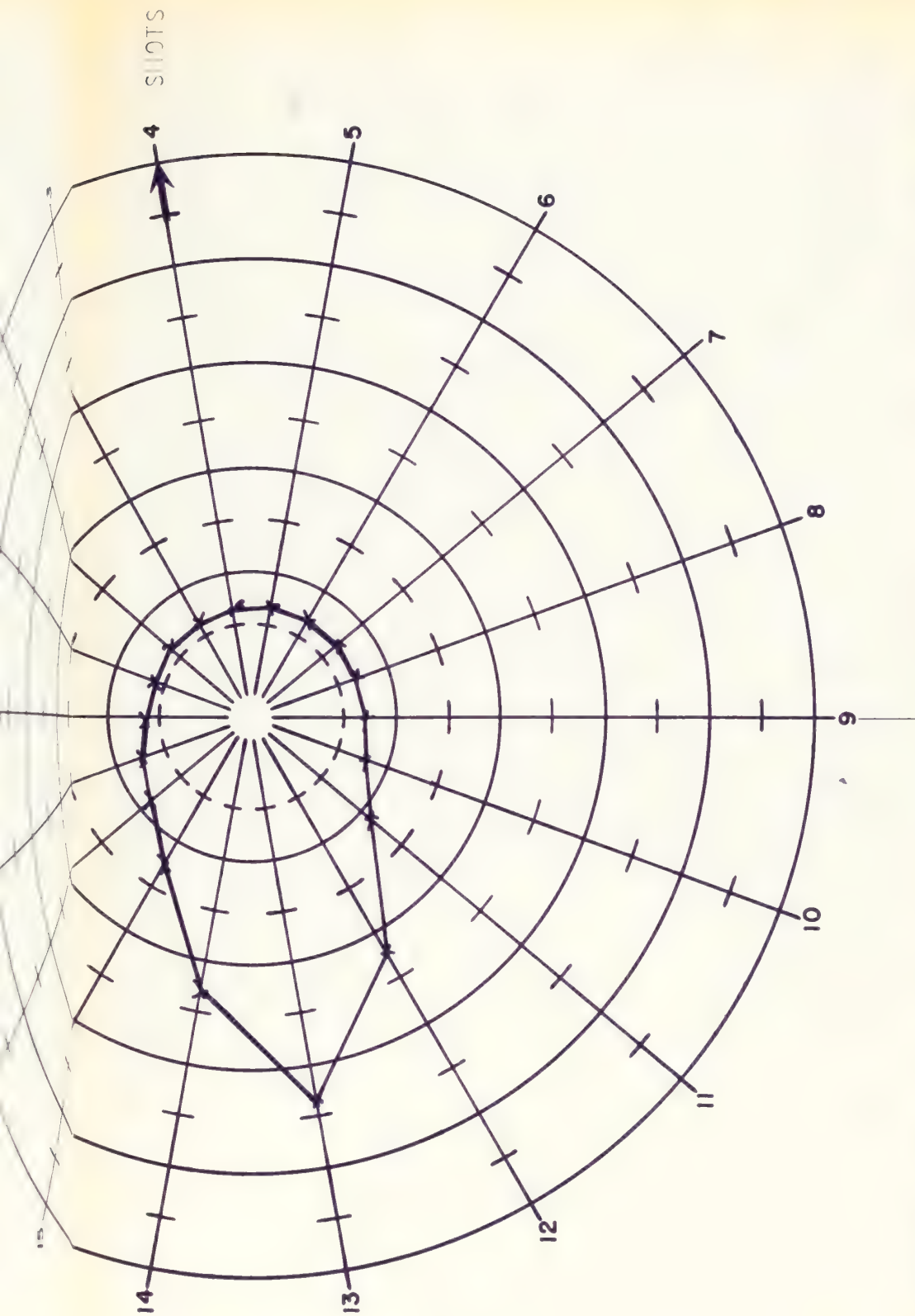
This chart, computation and/or interpretation of our readings from our ground gamma-ray detector and the logging instrument is presented to you in accordance with, but subject to, the General Terms and Conditions on file with our Service Order for this job. The readings could be adversely affected by changes made in the drill hole and other conditions unknown to us.

Schlumberger

RADIOORIENTATION PLOT

POT-B

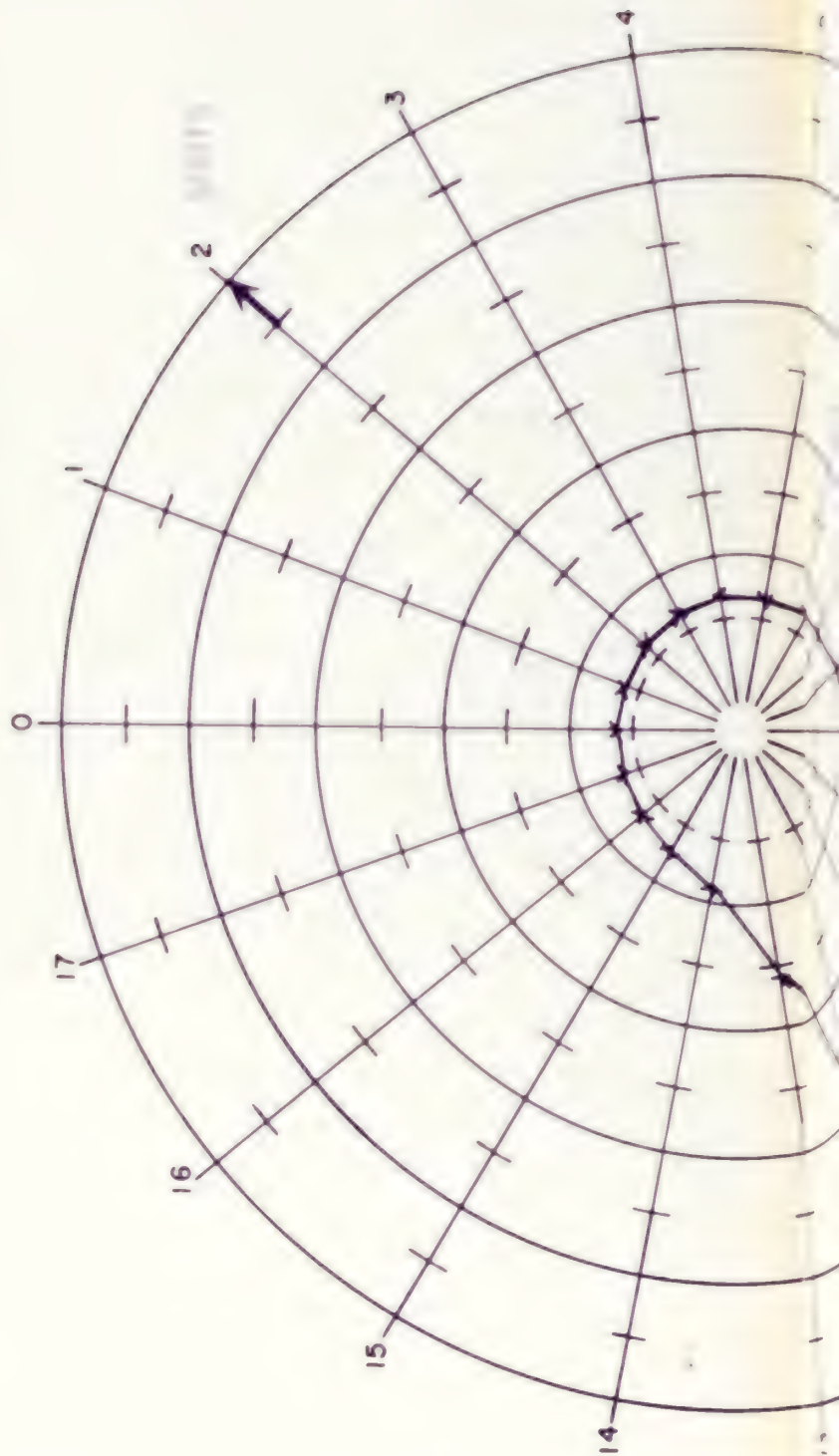


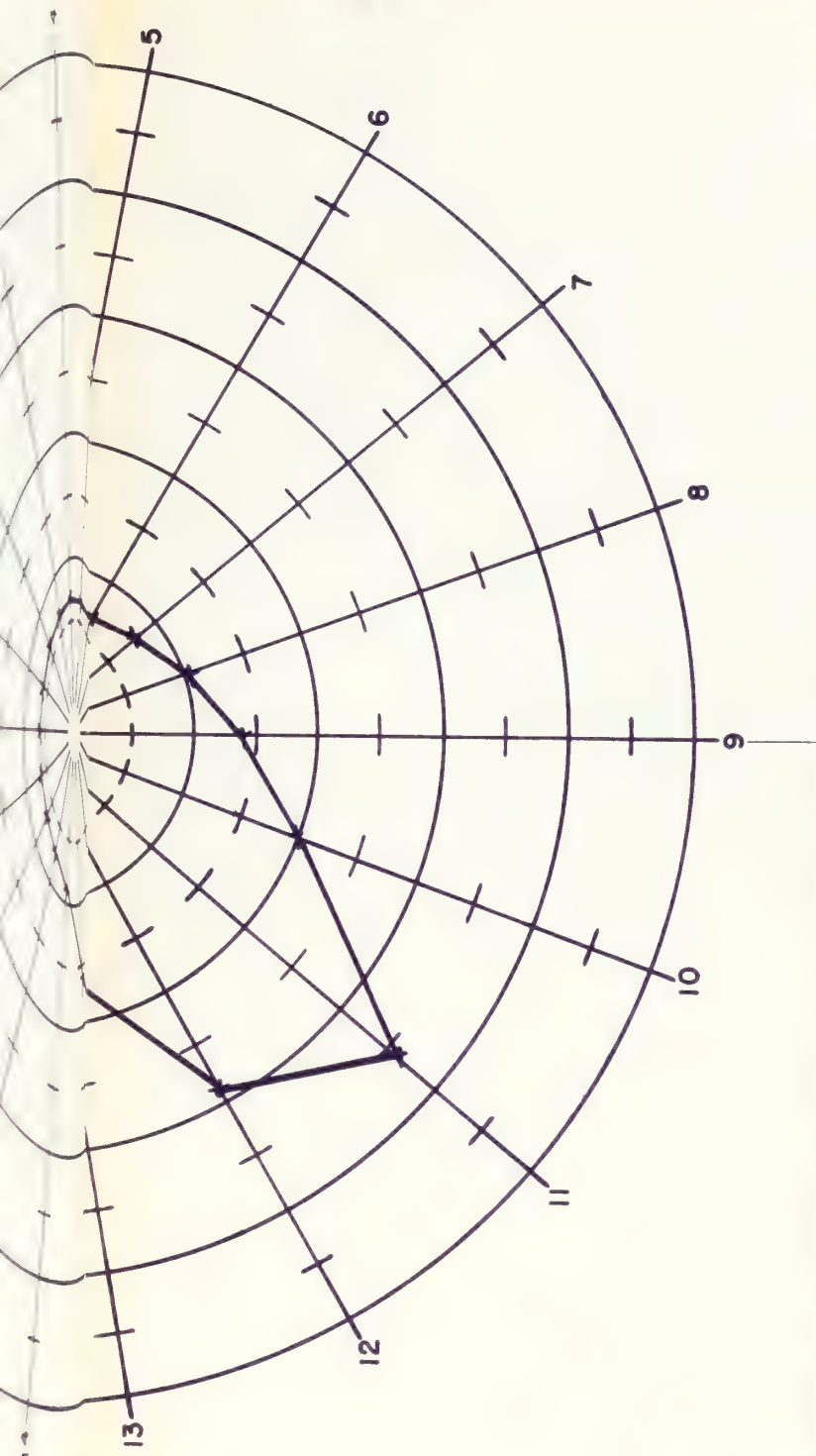


This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

RADIOORIENTATION PLOT

POT-B



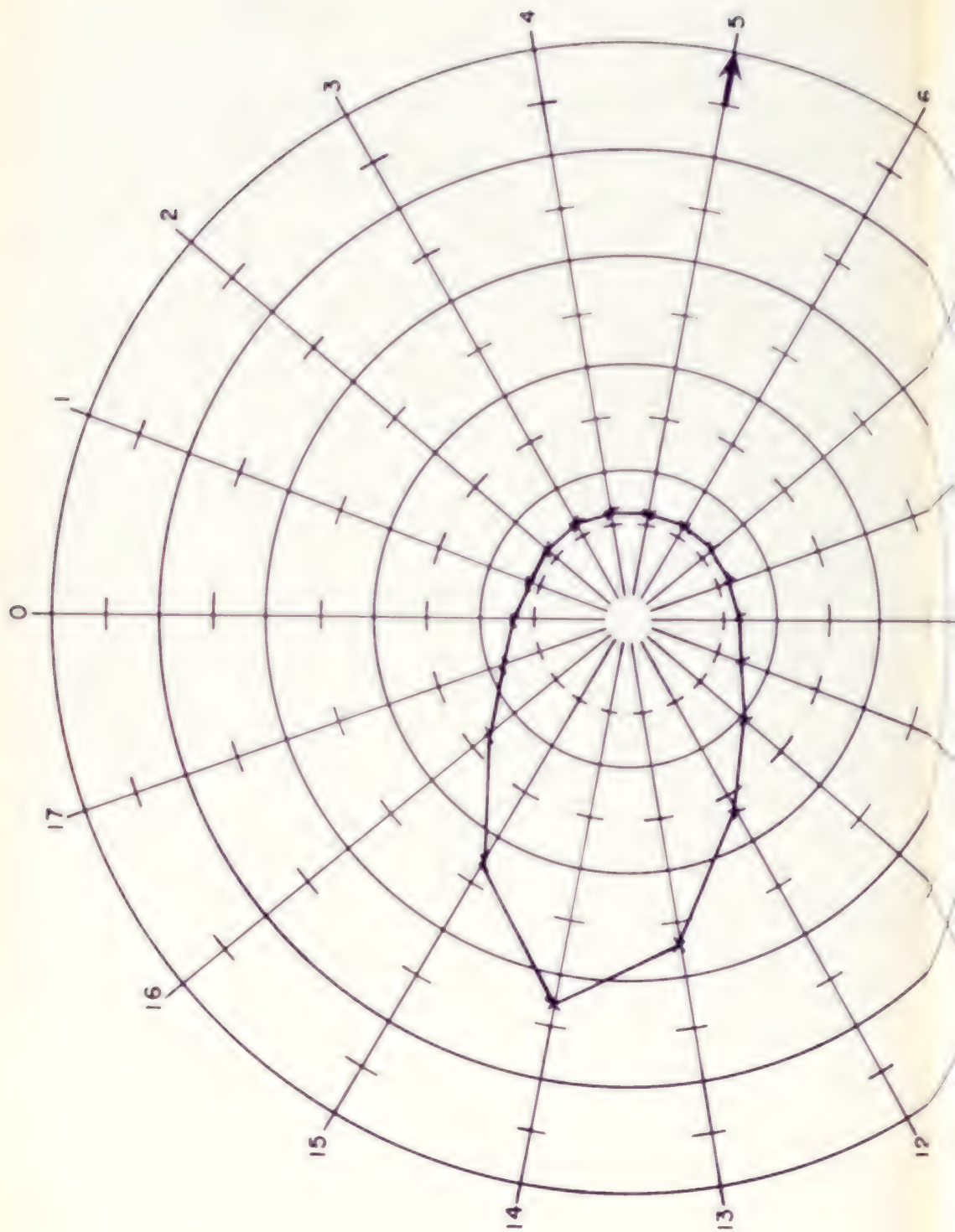


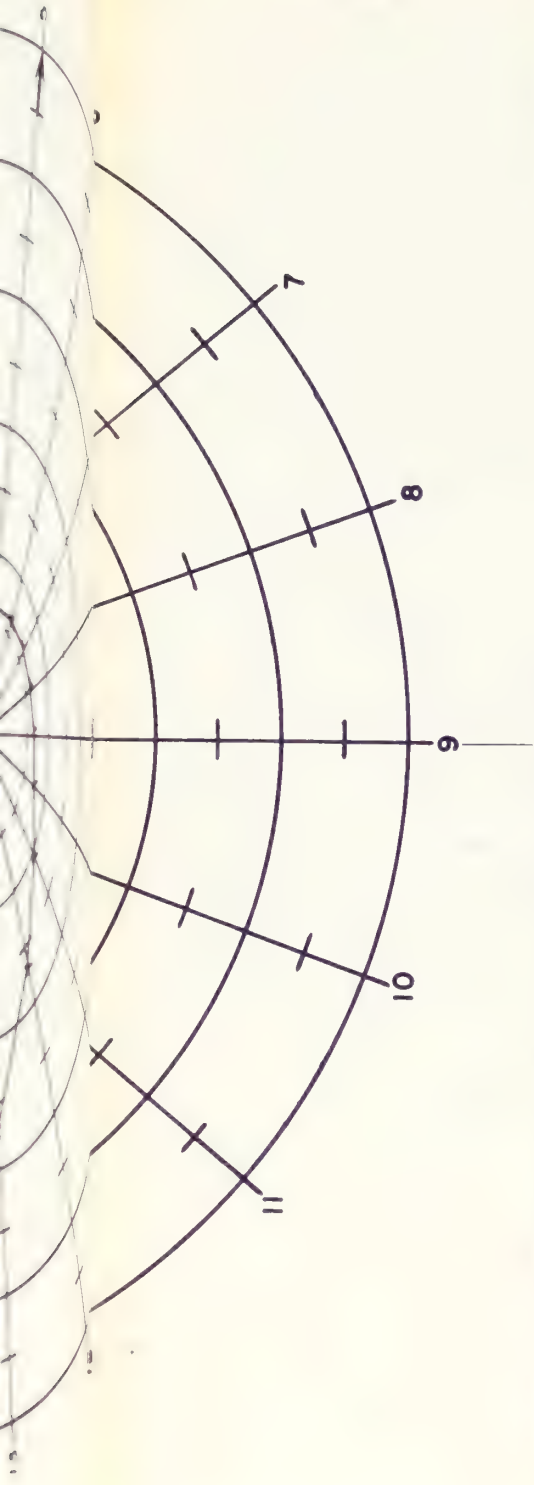
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

Schlumberger

RADIO-ORIENTATION PLOT

POT-B





This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.

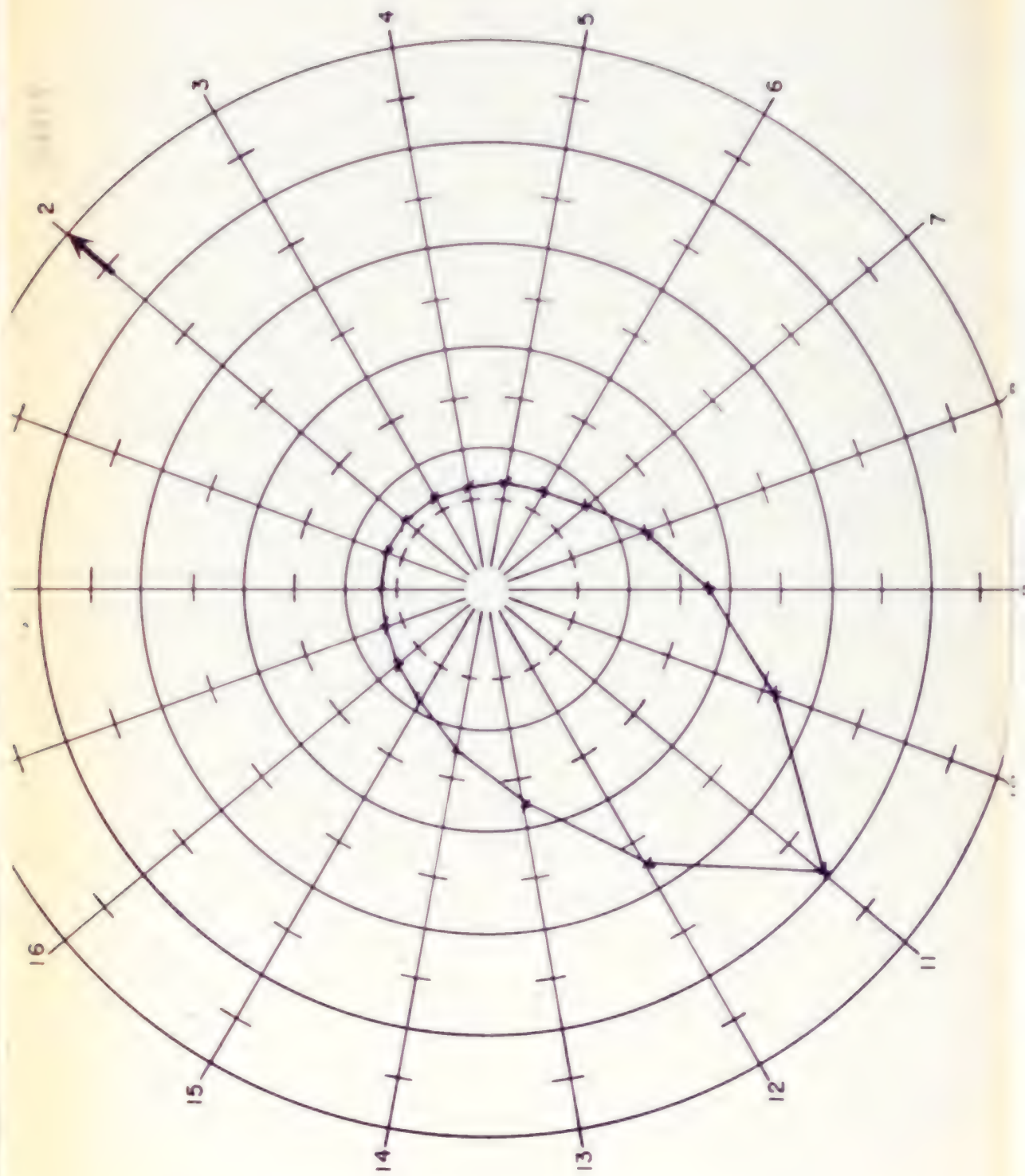


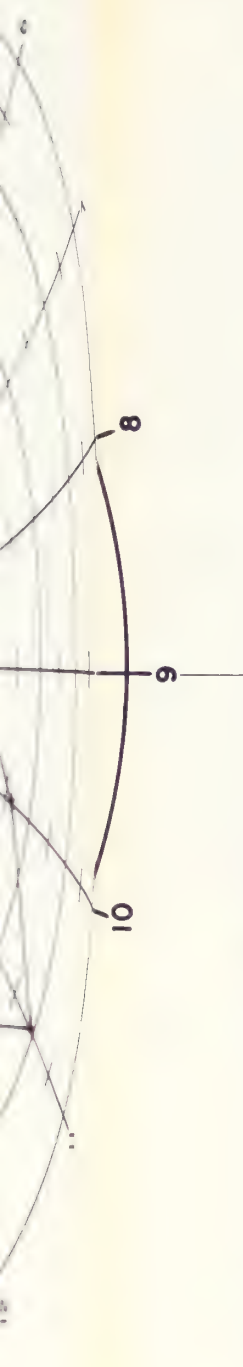
RADIOORIENTATION PLOT

POT-B

1. SHORT STRING-PERFORATED 0.75-0.35 ONE SLIT PER FOOT WITH 1 11/16" HYPERCON







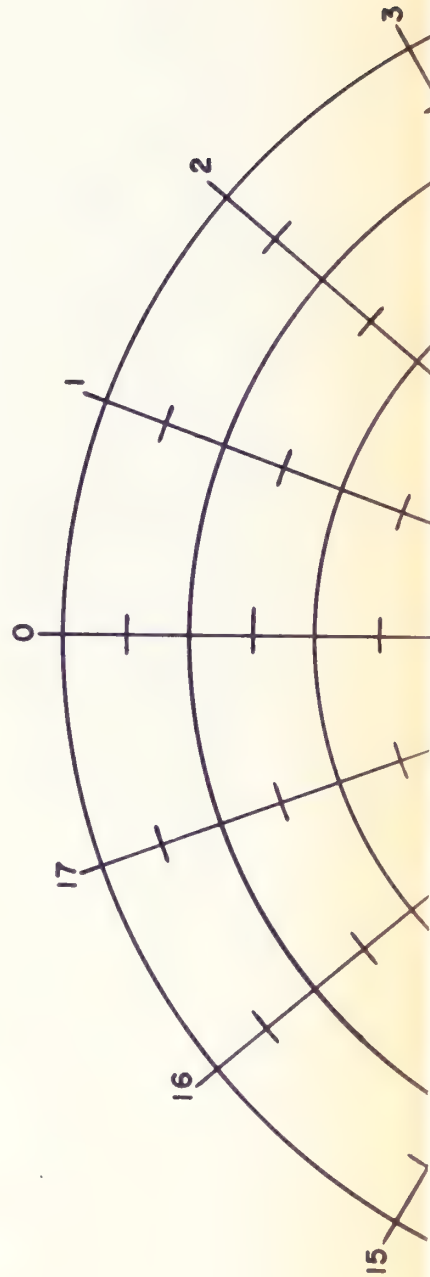
This chart, computation and/or interpretation of our readings from our gamma-gamma orientation and detecting instrument is presented to you in accordance with, but subject to, the General Terms and Conditions as are set out on pages 1 and 2 of our current Price Schedule and which are as set out on the reverse side of our Service Order for this job. The readings could be adversely affected by vagrant metal in the drill hole and other conditions unknown to us.



RADIOORIENTATION PLOT

POT-B

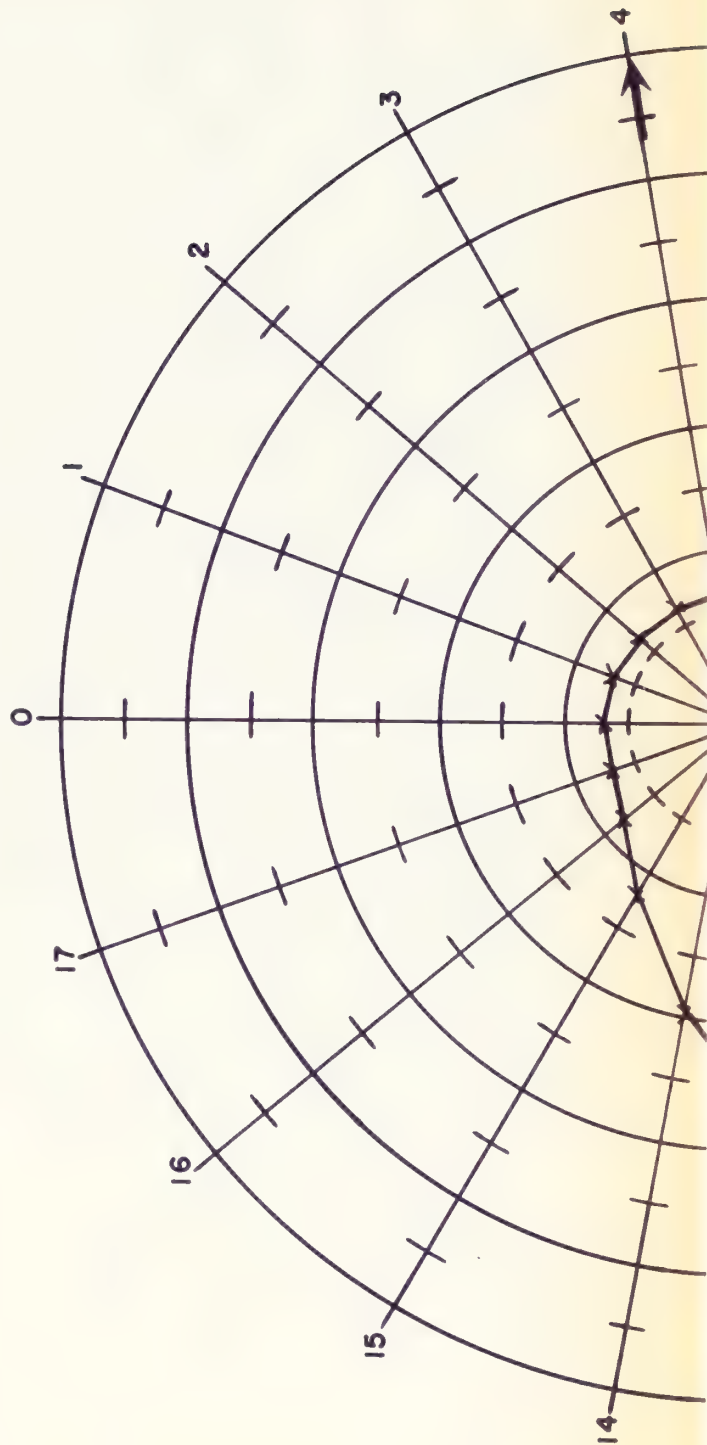
... RT STRIP-PERFORATED 314-9.4 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME

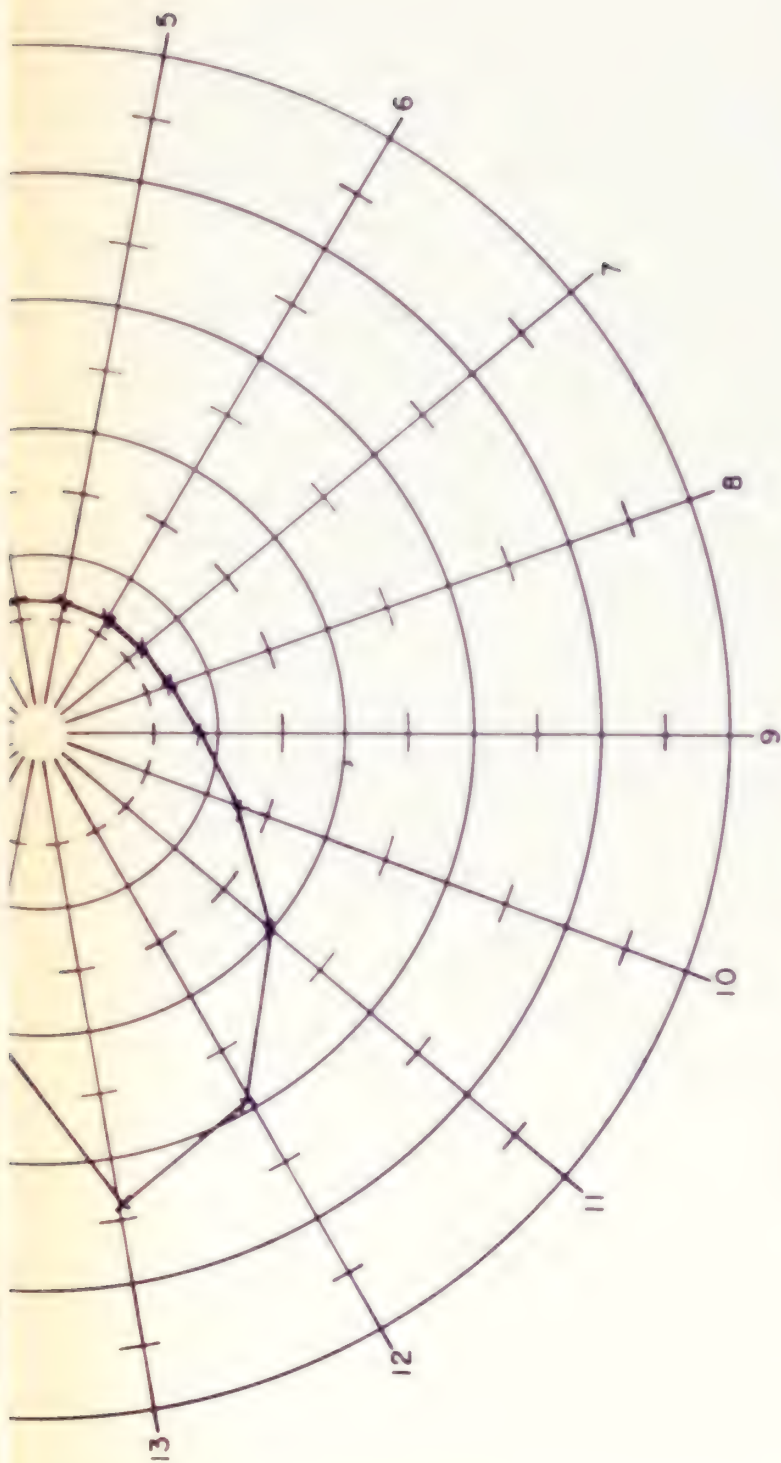


RADIOORIENTATION PLOT

POT-B

...SHORT STRIP-OPERATED ... ONE SHOT PER FOOT WITH 1 11/16" HYPERDUONE



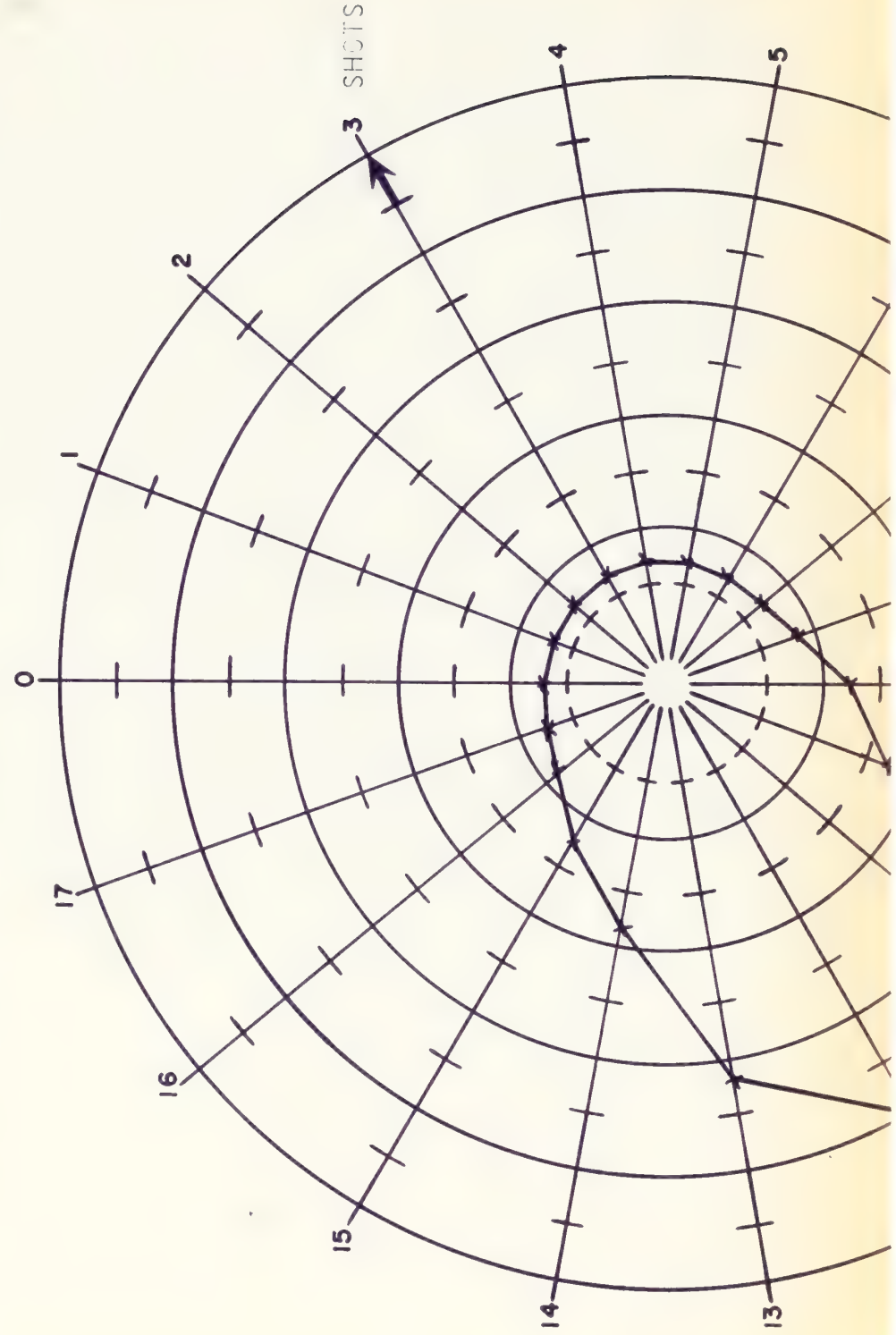


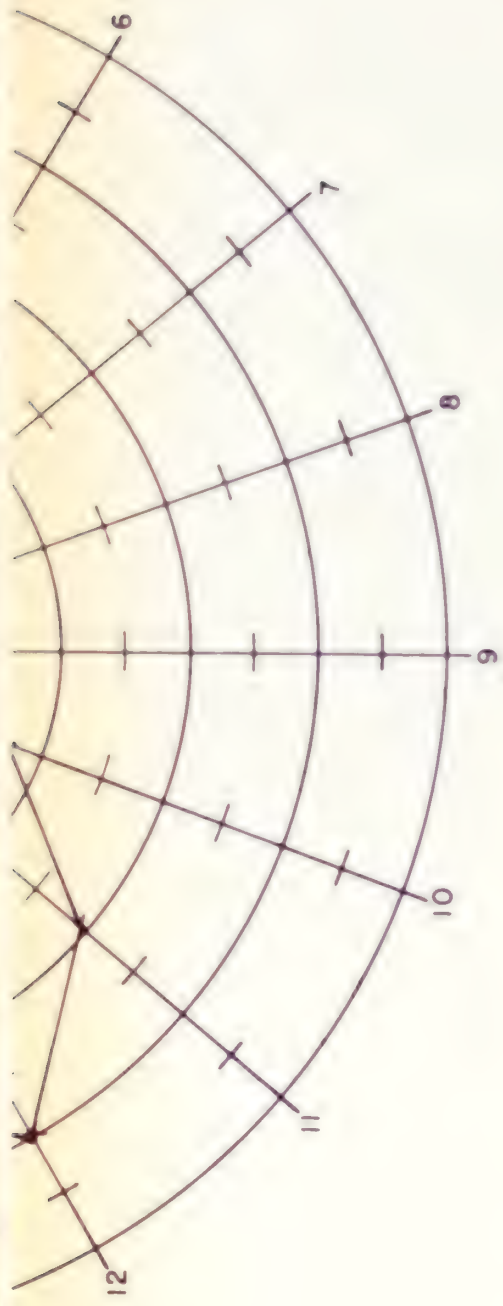
This chart, computed and/or interpreted of one reading from two ground-potential measurements and the testing instrument is presented to you as illustrated in its plot where the "line of best fit" is drawn. The line of best fit is drawn through points 1 and 2 and the tangent line is drawn through points 3 and 4. The line of best fit is drawn through points 1 and 2 and the tangent line is drawn through points 3 and 4. The line of best fit is drawn through points 1 and 2 and the tangent line is drawn through points 3 and 4.

RADIO-ORIENTATION PLOT

POT-B

... SHORT STRING-PERFORATED 385-895 ONE SHOT PER FOOT WITH 1 11/16" HYPERDOME





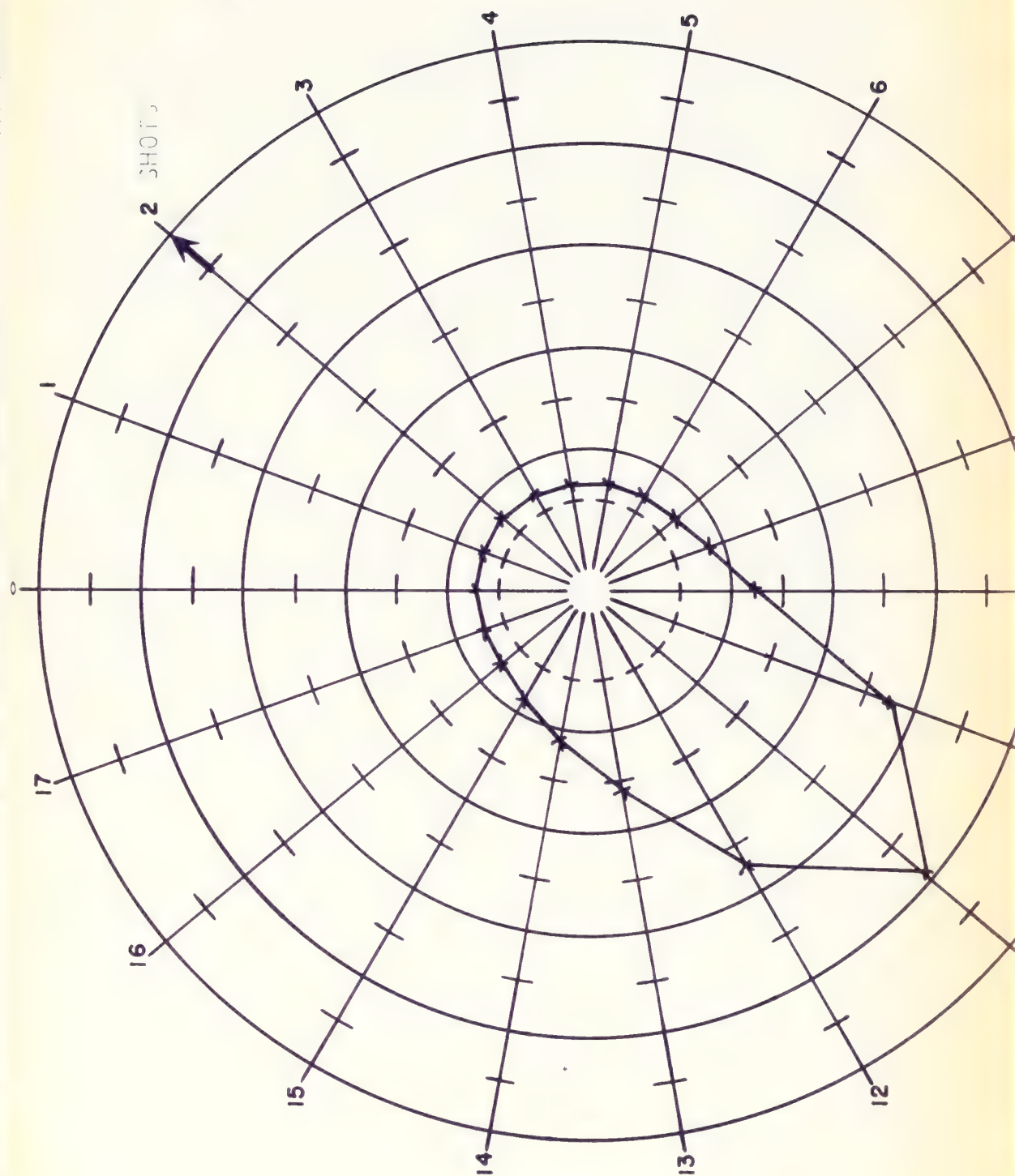
This chart, computed on an Air Late geophone, is for use with the Schlumberger geophone. The chart is presented to you in accordance with the instructions on the Schlumberger geophone. It is not to be used for any other purpose. The chart is for use with the Schlumberger geophone only. The chart is for use with the Schlumberger geophone only. The chart is for use with the Schlumberger geophone only.

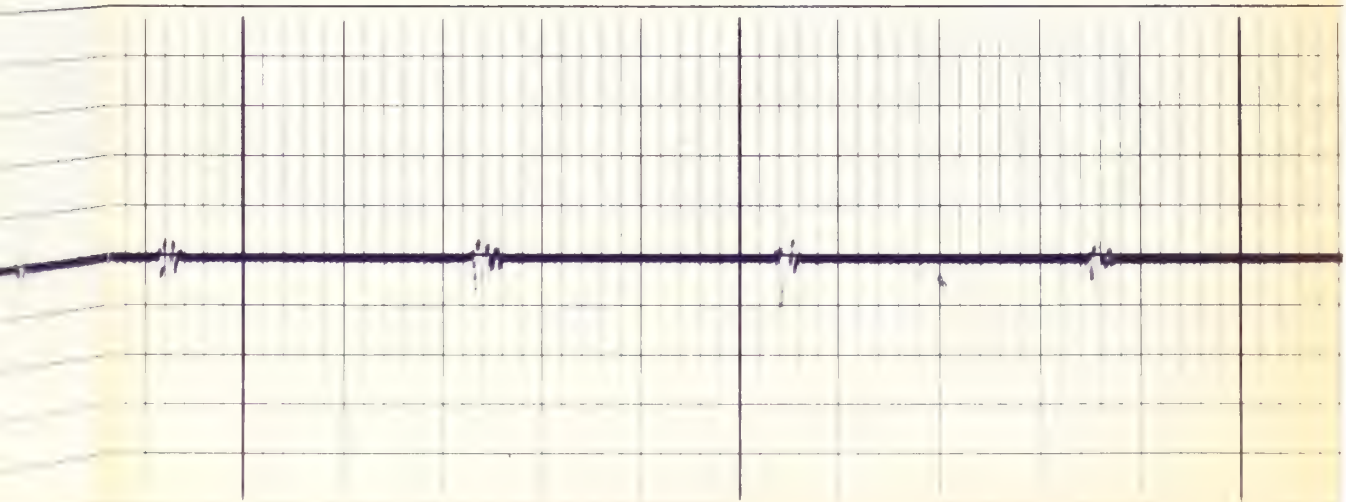
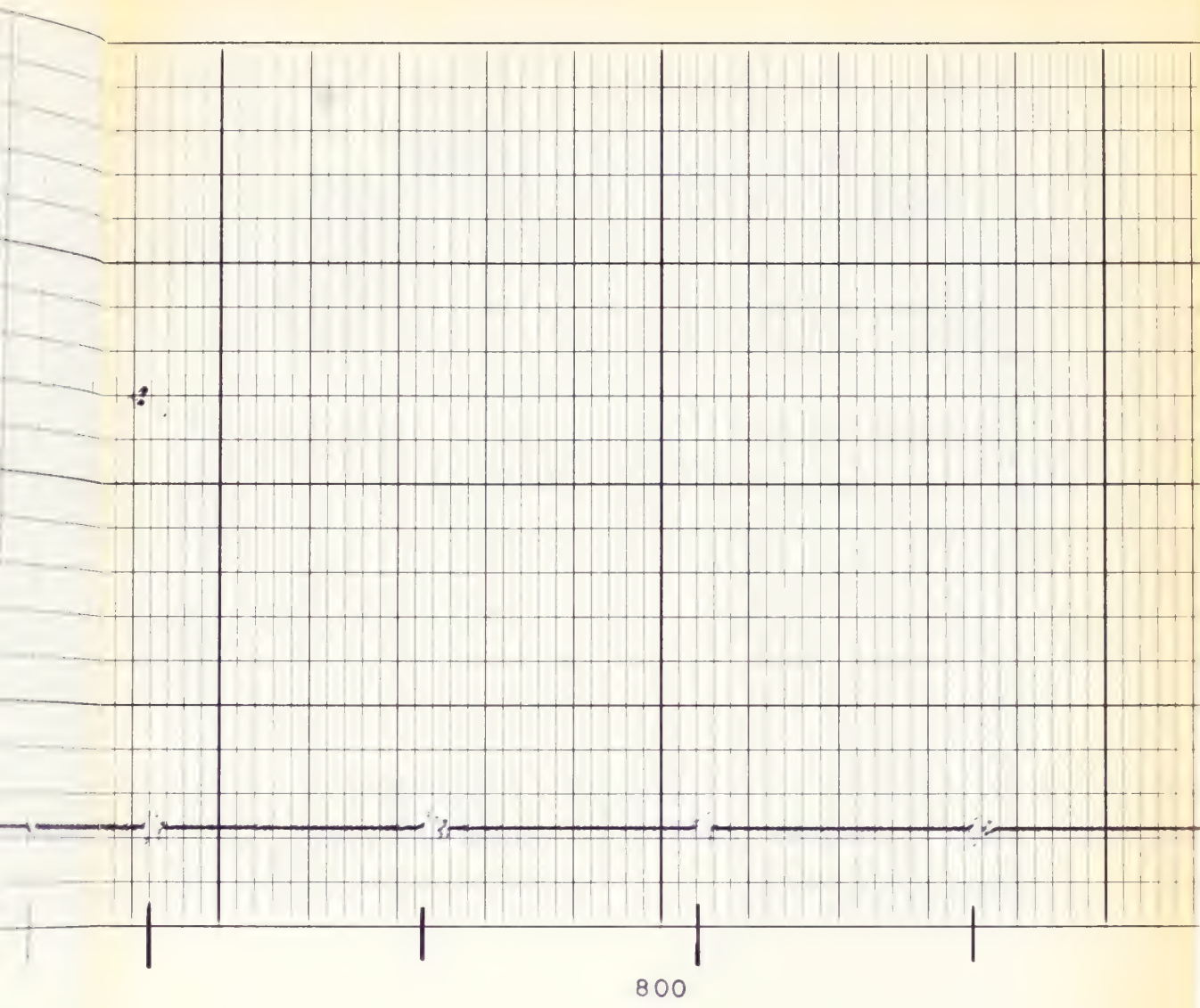


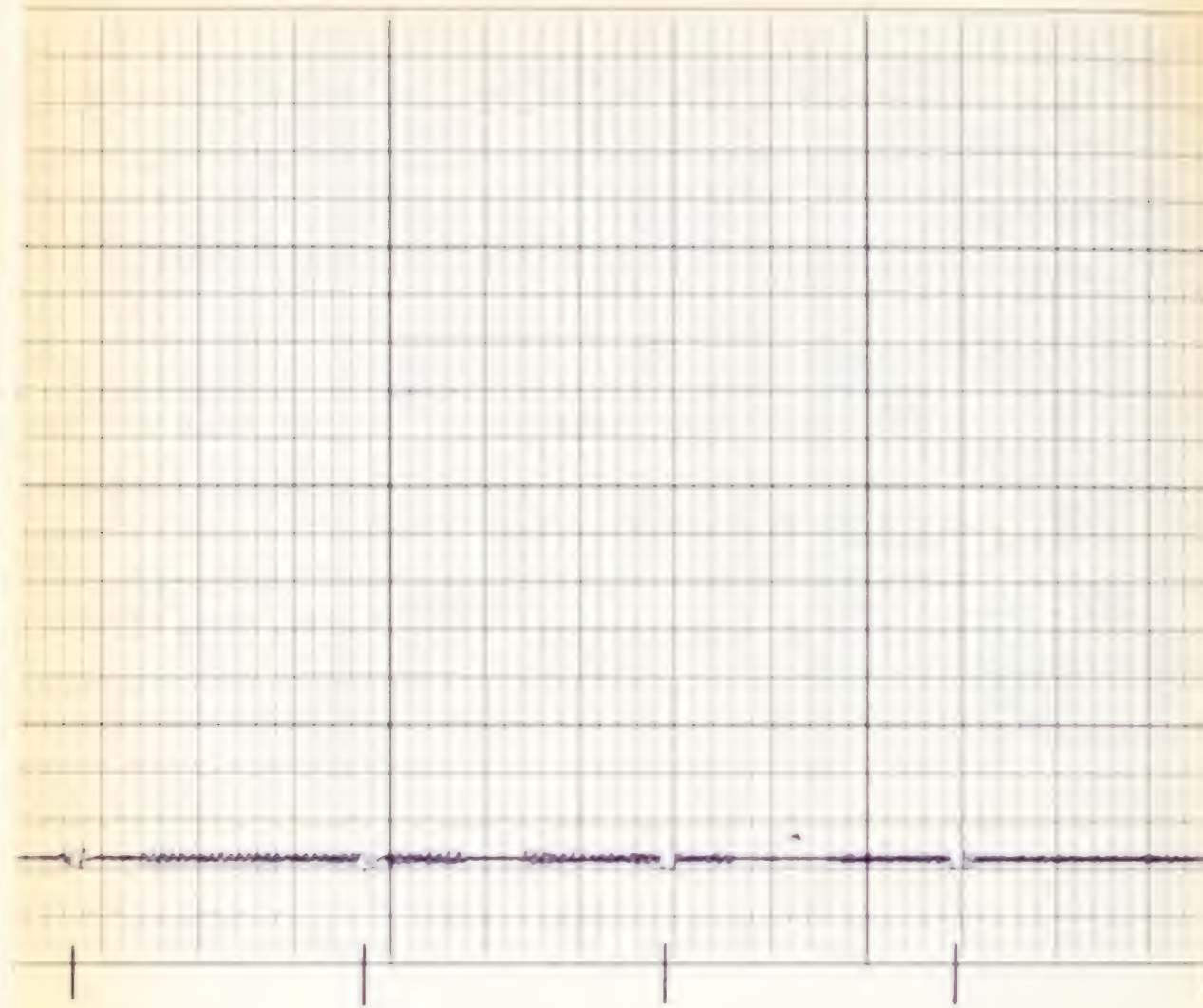
RADIO-ORIENTATION PLOT

POT-B

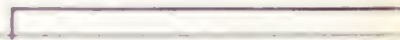
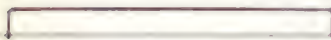
RADIO ORIENTATION PLOT
FOY B







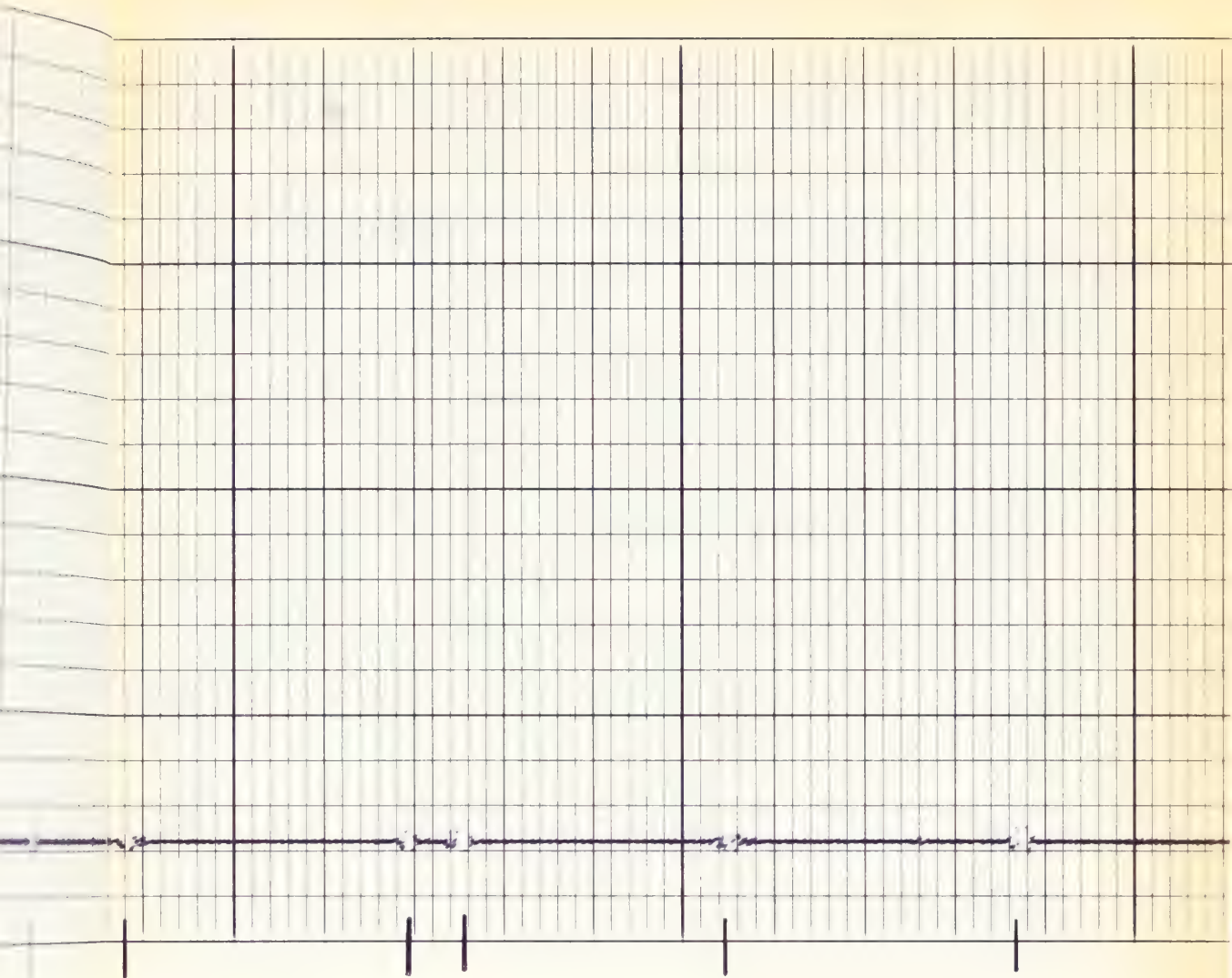
900



INTEGRATED INTERVAL
 RECORDED ONE SHOT
 PER FOOT WITH 11.1111
 IN PERIOD

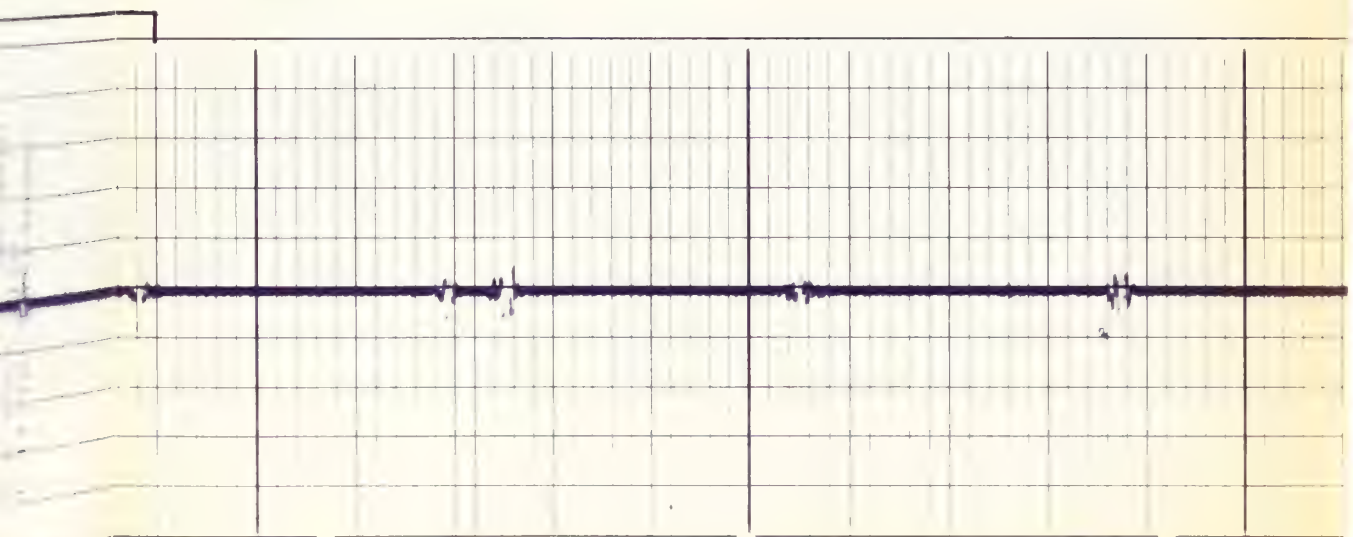
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 RECORDED ONE SHOT
 PER FOOT WITH 11.1111
 IN PERIOD

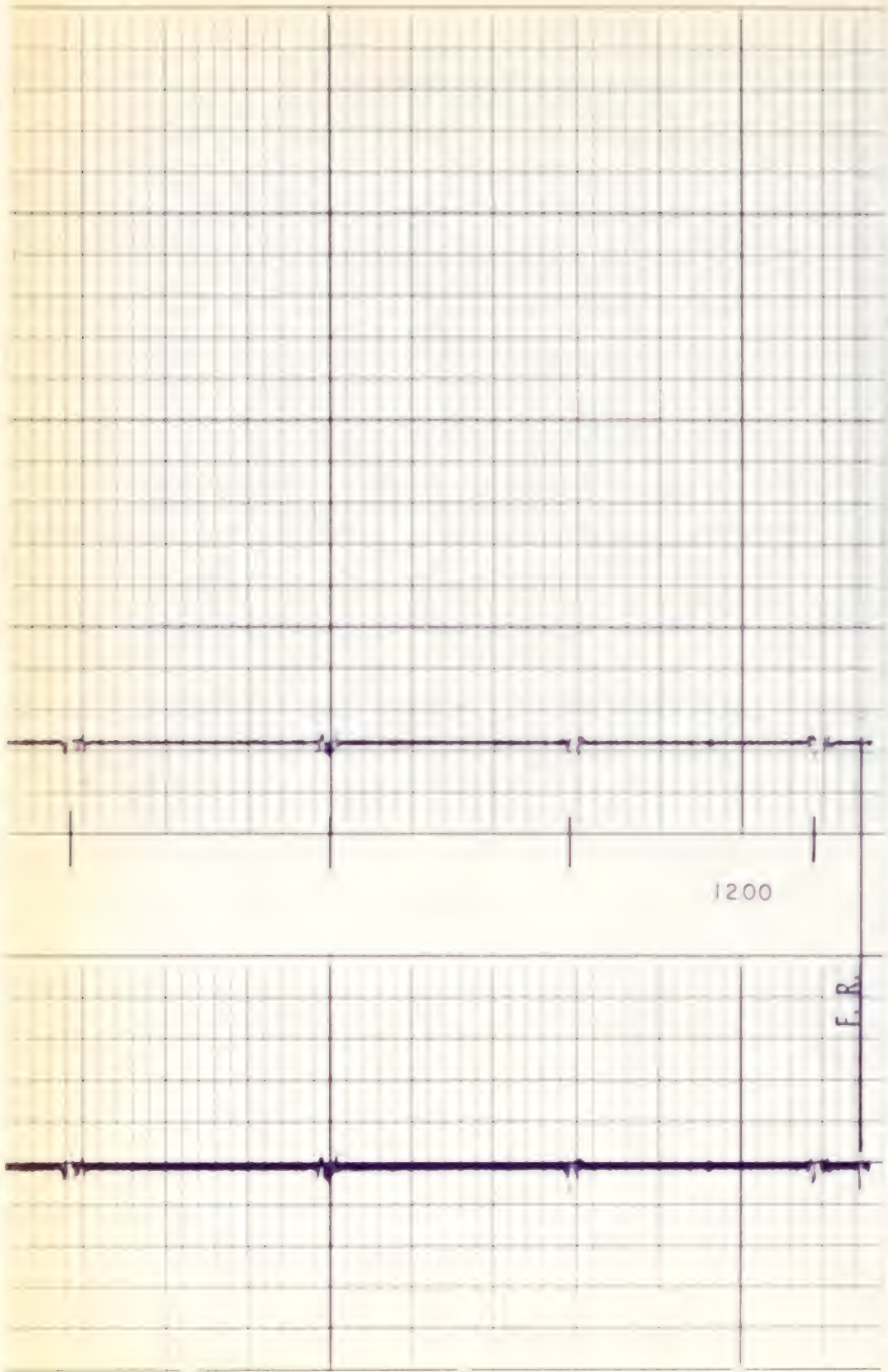
INTEGRATED INTERVAL
 RECORDED ONE SHOT
 PER FOOT WITH 11.1111
 IN PERIOD



1000

1100





COMPANY

WELL

ASTORIA HIGH SCHOOL

Geological

COMPANY
WELL

Schlumberger

FIELD

PRODUCTION LOGGING SERVICES

CONQUER G.D.

ELC ELA CO, COLORADO

Schlumberger

CEMENT BOND LOG

VDL-001

| | | |
|--|---|------------------------------------|
| COUNTY <u>RIO ARIZONA</u> Field or LOCATION <u>SORCHUM GULCH</u> WELL <u>NO. 1</u> COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | COMPANY <u>ATLANTIC RICHFIELD COMPANY</u> | |
| | WELL <u>S.G. NO. 1</u> | |
| | FIELD <u>SORCHUM GULCH</u> | |
| | COUNTY <u>EL PASO</u> STATE <u>COLORADO</u> | |
| LOCATION <u>104.5' FE 9 10 14' FSI</u> | | API Serial No. <u>6929</u> |
| Sec. <u>2</u> Twp. <u>35</u> Rge. <u>97W</u> | | Other Services: PDC-GR SP-HJ |
| Permanent Datum: <u>GROUND LEVEL</u> , Elev. <u>6428</u> | | Elev.: K.B. <u>----</u> |
| Log Measured From <u>GL</u> , <u>0</u> Ft. Above Perm. Datum | | D.F. <u>----</u> |
| Drilling Measured From <u>GL</u> | | G.L. <u>6428</u> |

| | | | |
|-------------------|---------|------------------|--------------|
| Date | 3/11/75 | Type Drill Fluid | WATER |
| Run No. | ONE | Fluid Level | FULL |
| Depth — Driller | 2436 | Max. Rec. Temp. | °F |
| Depth — Logger | 2110 | Est. Cement Top | 1400 |
| Btm. Log Interval | 2131 | Equip. Location | 5643 VERNAL |
| Top Log Interval | 130 | Recorded By | J.T. AUBYN |
| Open Hole Size | 6 3/4 | Witnessed By | MR. DON TAIT |

| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom |
|----------------|-------|-------|-------|------------|------|--------|
| Surface String | 2 5/8 | | | I-C | SURF | 154 |
| String 1 | 2 3/8 | 4.7 | | I-C | SURF | 2519 |
| String 2 | 2 3/8 | 4.7 | | I-C | SURF | 1134 |
| Liner | | | | | | |

| PRIMARY CEMENTING DATA | | | | |
|------------------------|---------|------------|------------------|-------|
| STRING | Surface | Protection | Production | Liner |
| Vol. of cement | | | 385 CUB. | |
| Type of cement | | | CLASS "H" | |
| Additive | | | 1% CAL-CH. CR. | |
| | | | 10% SCL-SEAL | |
| Retarder | | | 1% SCL-FLOW SEAL | |
| Wt. of slurry | | | | |
| Water loss | | | | |
| Type fluid in csg. | | | | |
| Fluid wt. | | | | |

The well name, location and borehole reference data were furnished by the customer

LOG NAME

PRIMARY CEMENTING PROCEDURE

REMARKS

| | Hour — date | Hours from start of operation | Service Order No. |
|------------------------|---------------|-------------------------------|------------------------------|
| Started pumping cement | 11 30 1-18-75 | | Csg. Collars Recorded 13 ft. |
| Release pressure | 1 15 1-18-75 | | |
| Start Cement Bond Log | 1 15 1-18-75 | | |
| Finish Cement Bond Log | 2 01 1-18-75 | | |

| | | |
|-----------------|--------------|--|
| Preceding fluid | Volume bbls. | Pipe reciprocated during Pumping: Yes No |
| Cement pumped | bbls./minute | Pipe reciprocated after plug down: Yes min. No |

SQUEEZE JOB DETAIL

EQUIPMENT DATA

Centralizer Depths

Scratcher Depths

| | | | | |
|------------------------|---|---|-----------------------|----------|
| Squeeze number | 1 | 2 | Sonic Panel No. | SEP-1113 |
| Date | | | Sonic Cart No. | --- |
| Depth interval | | | Sonic Sande No. | --- |
| Type cement | | | CRP No. | --- |
| Volume of cement | | | Mem Panel No. | --- |
| Additive | | | GR Panel No. | --- |
| Retarder | | | GR Cart No. | --- |
| Weight of slurry | | | Centralizer: Type No. | 21E-1113 |
| Preceding fluid | | | To Level (MV) | --- |
| Breakdown pressure | | | Cart. Gain | --- |
| Max. pressure-stage 1 | | | CRP Intensity | --- |
| " " 2 | | | R9G Intensity | --- |
| " " 3 | | | Logging Speed | --- |
| Final maximum pressure | | | Time Constant | --- |
| Started pumping cement | | | | |
| Released pressure | | | | |
| Start CBL | | | | |
| Finish CBL | | | | |

AVERAGE WELL DRIFT:

from

to

from

to

from

to

TRANSIT TIME

CASING BOND

VARIABLE DENSITY

TRANSIT TIME

MICROSECONDS 200 SPACING 200

CASING BOND

MILLIVOLTS

50

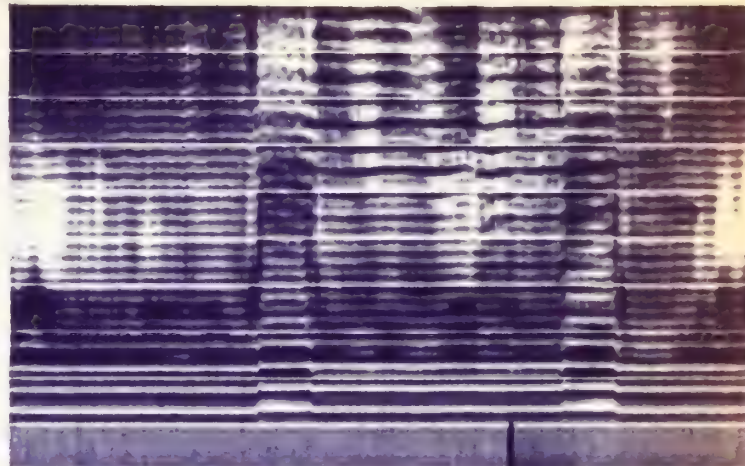
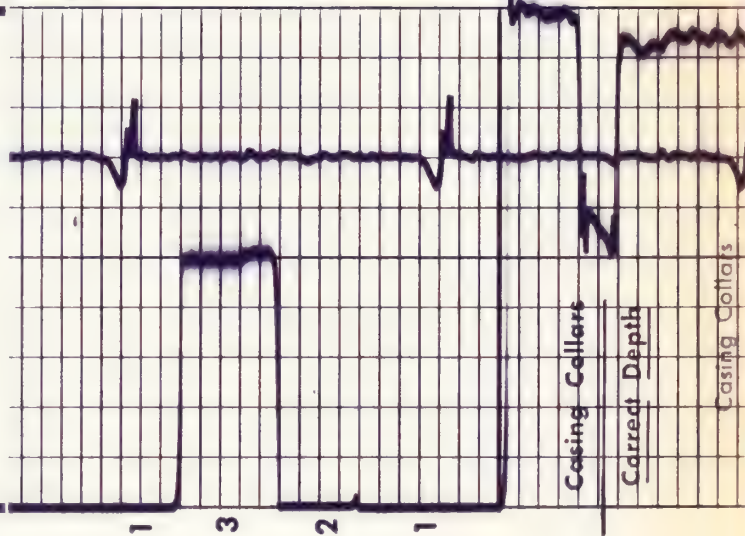
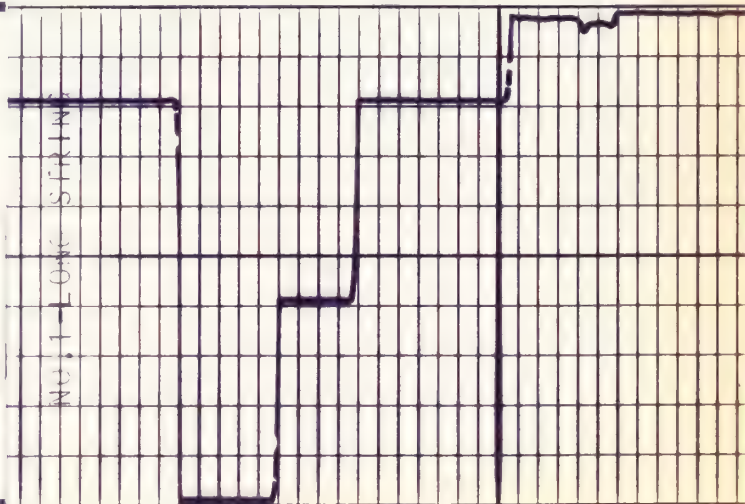
VARIABLE DENSITY

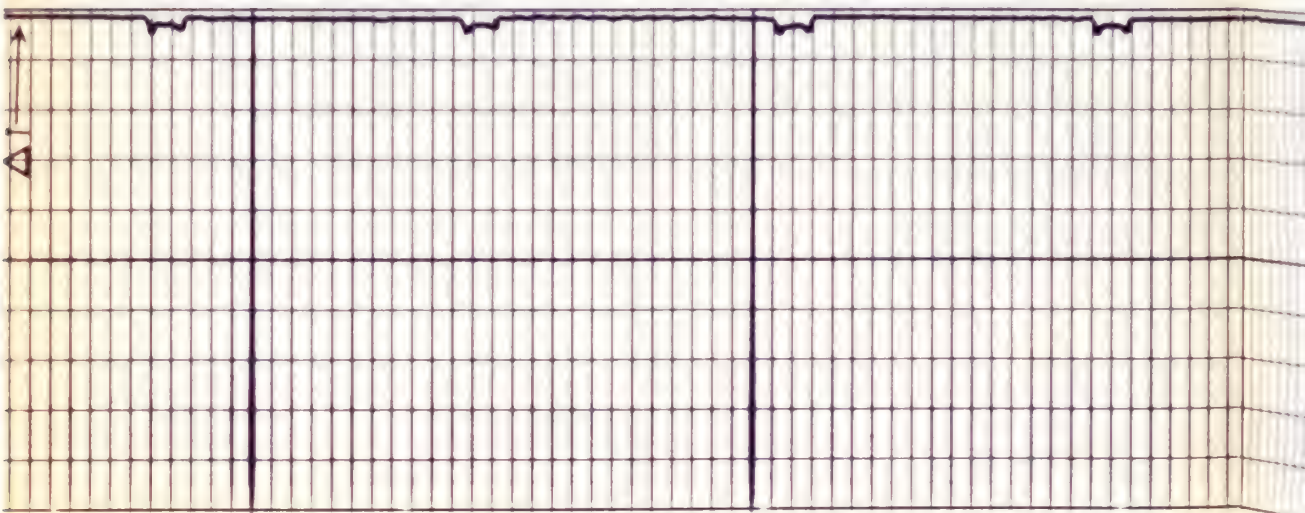
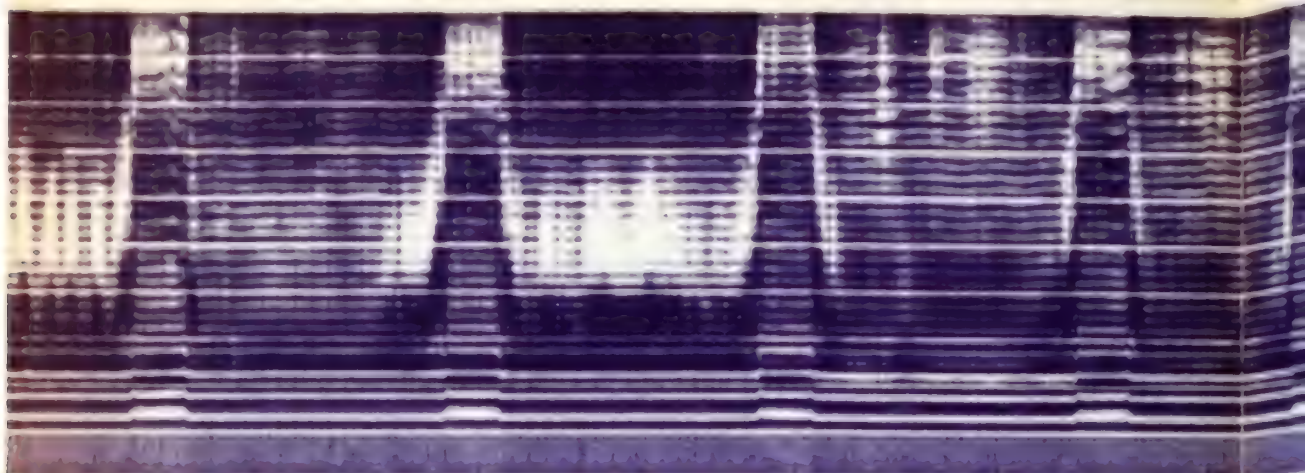
MICROSECONDS 5 FT. SPACING 1200

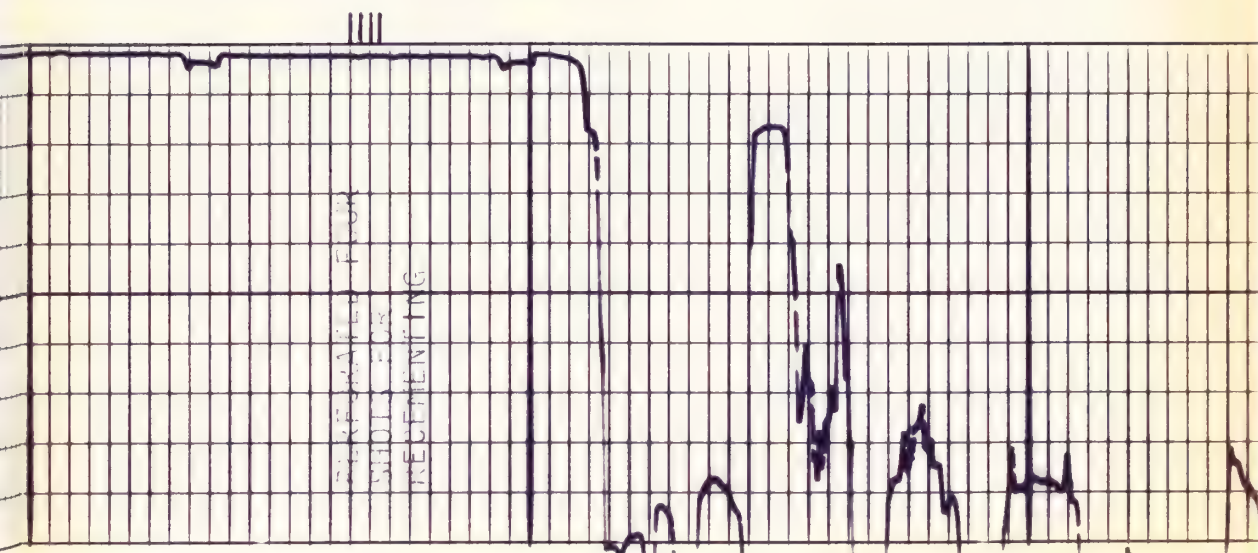
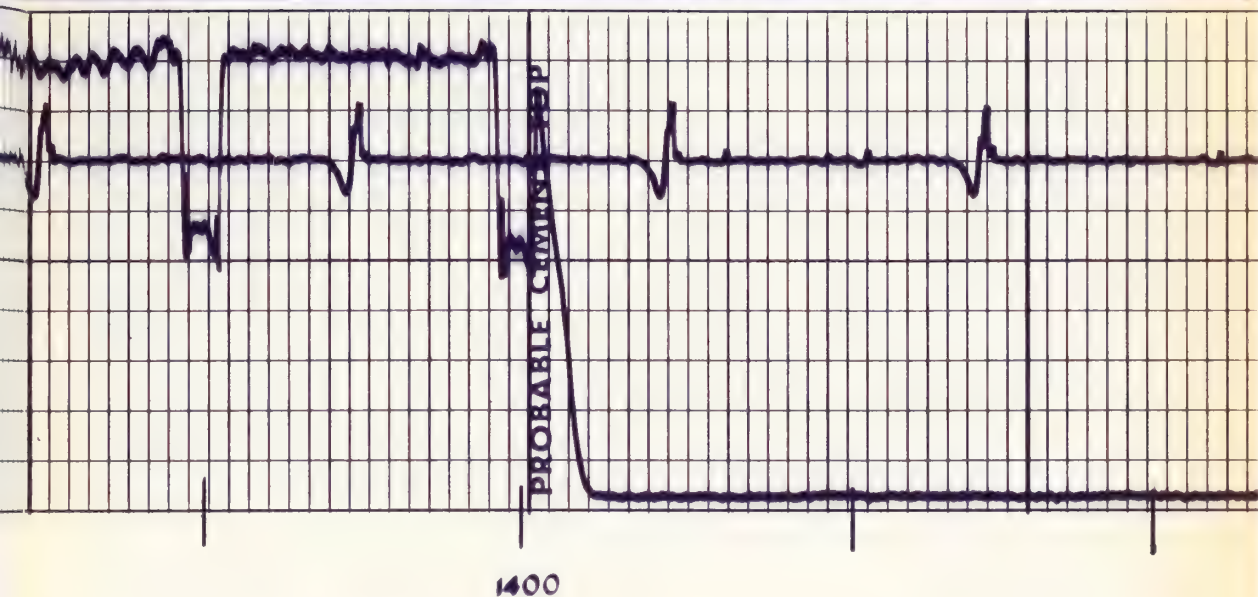
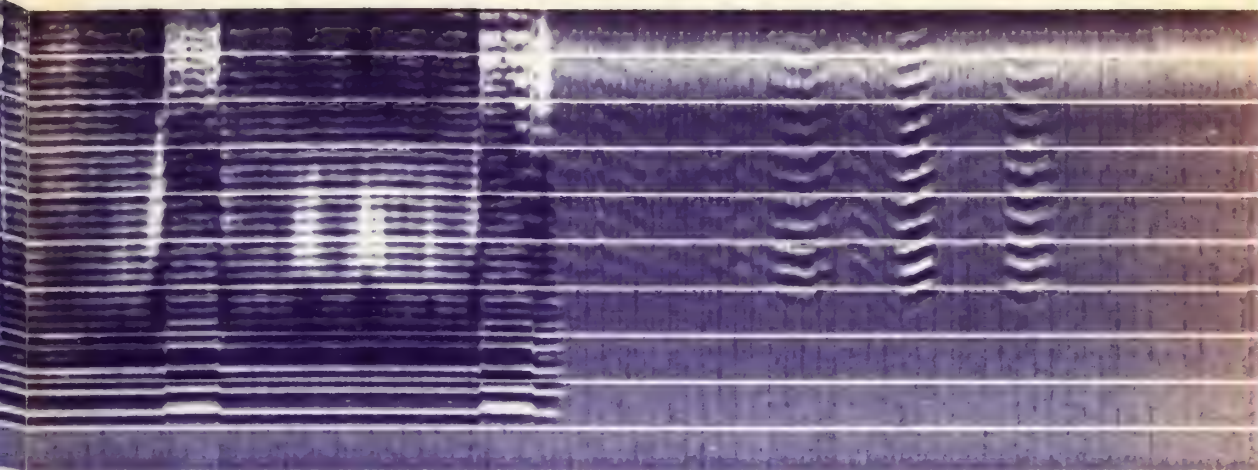
DEPTH

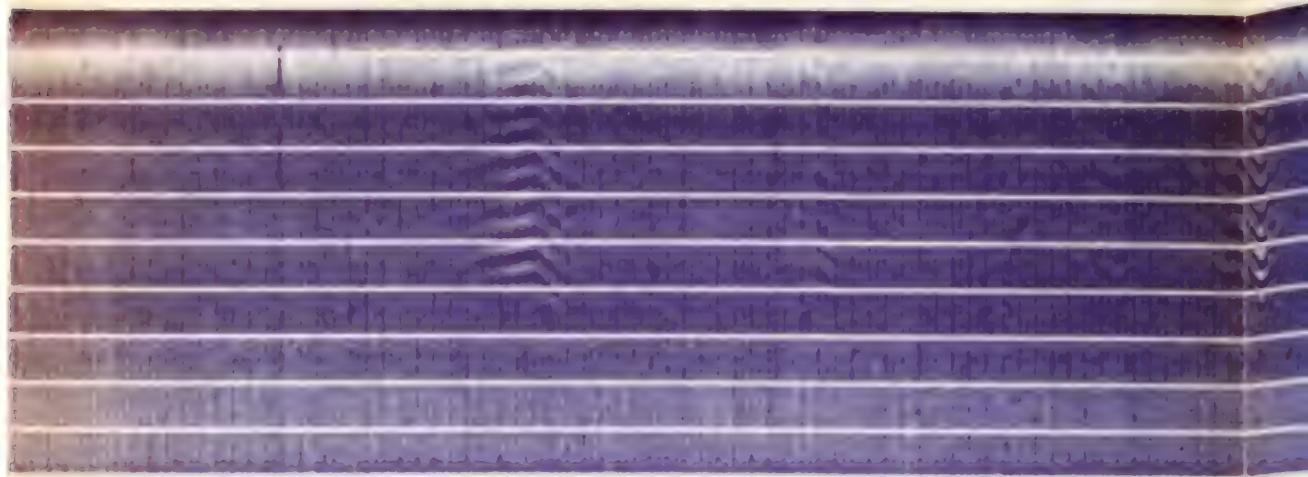
Casing Collars
Corrected Depth

UT



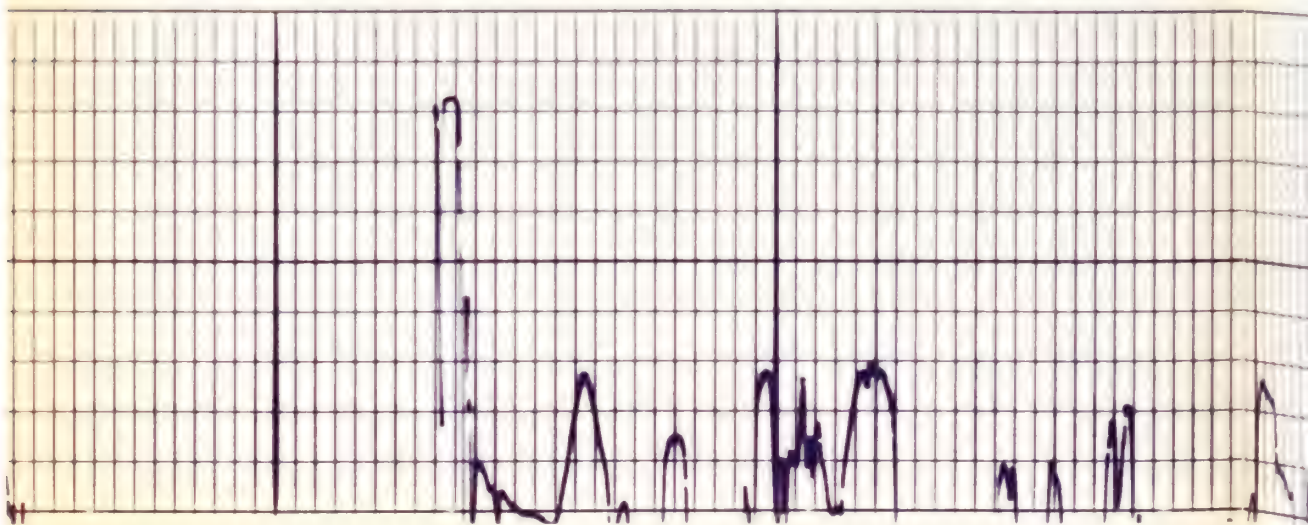


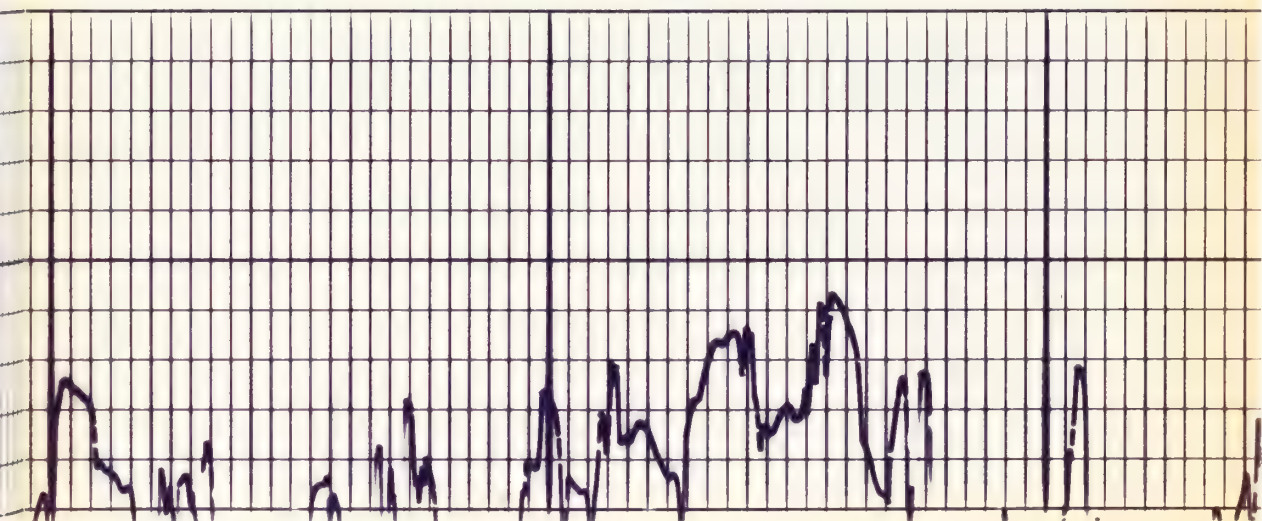
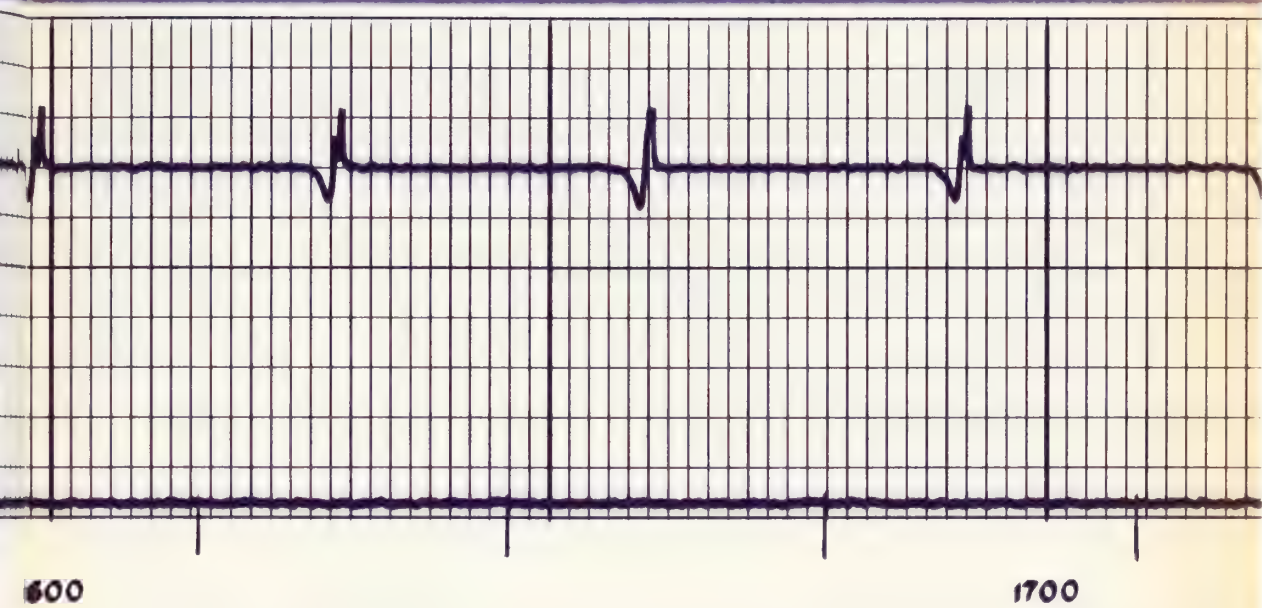
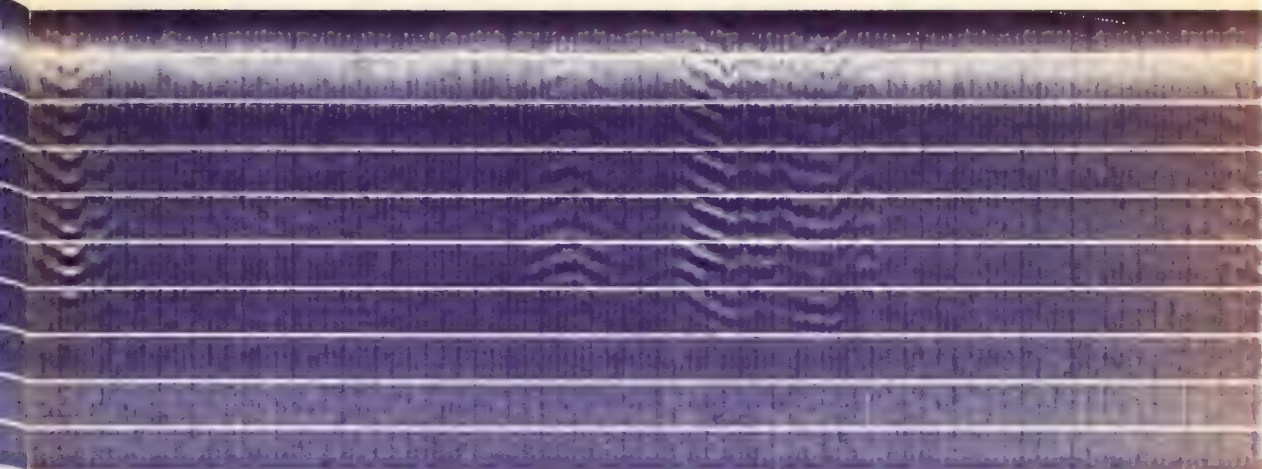


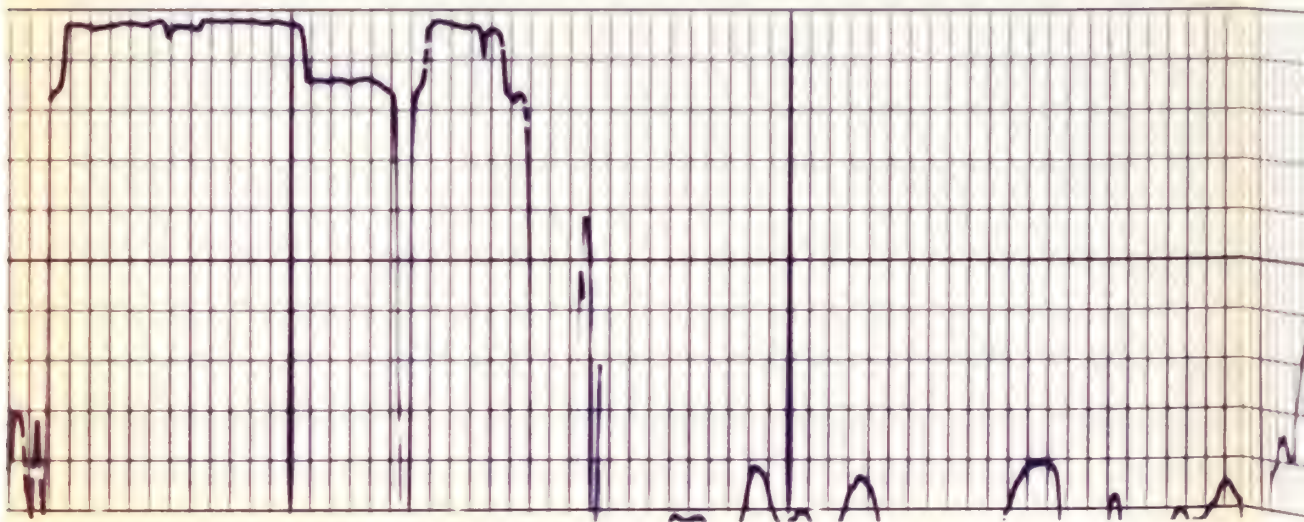
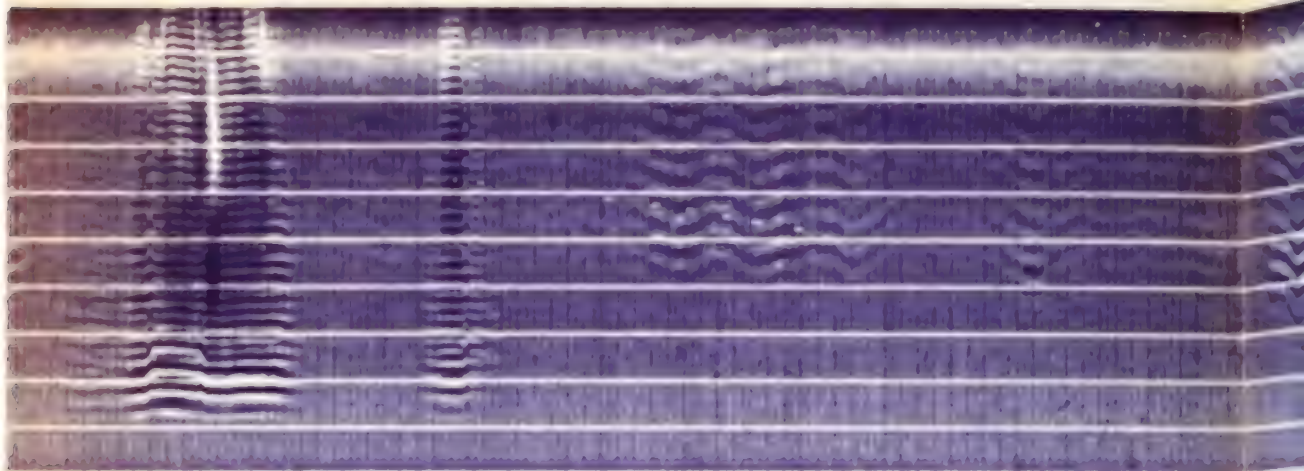


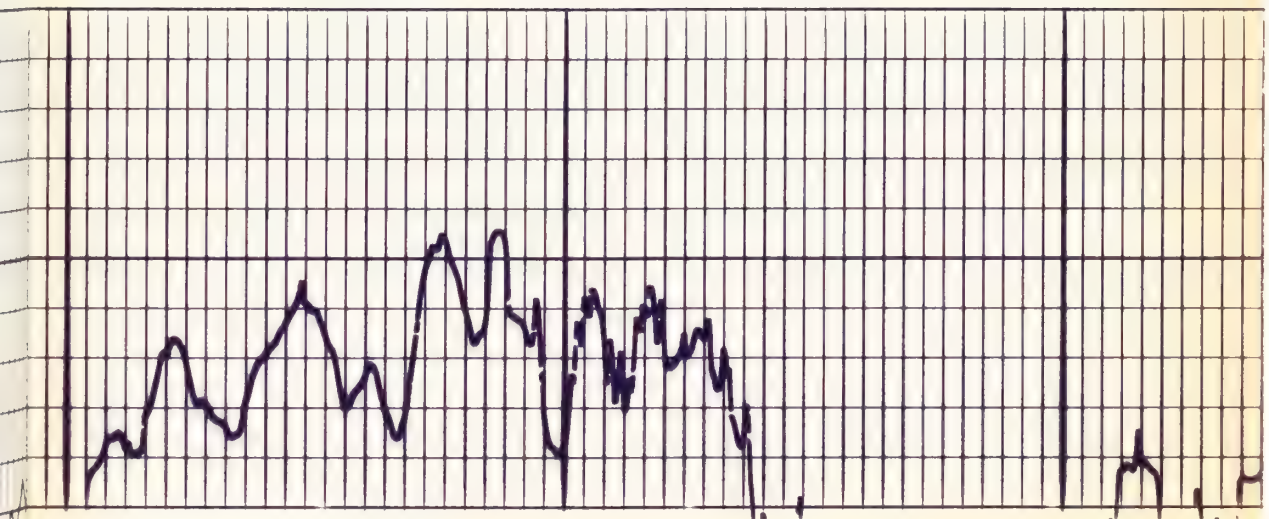
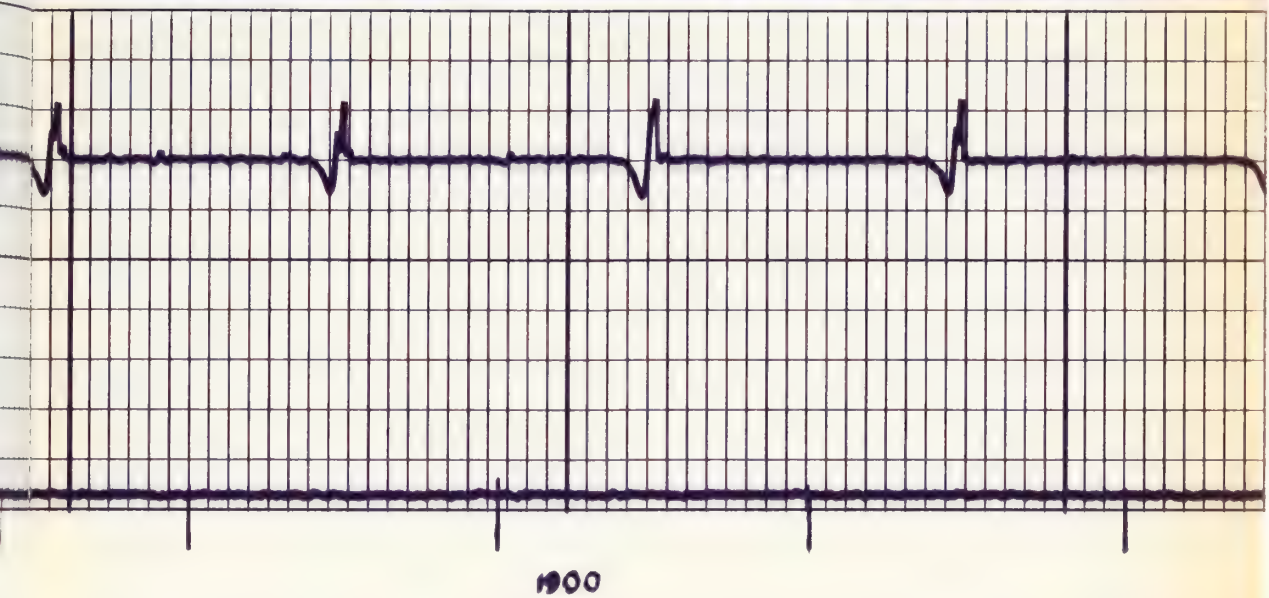
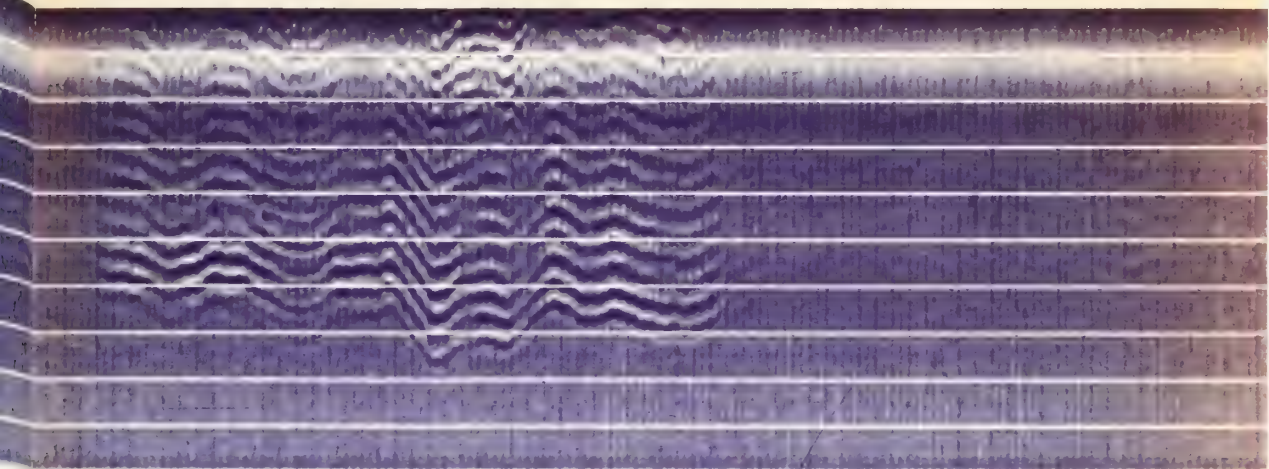
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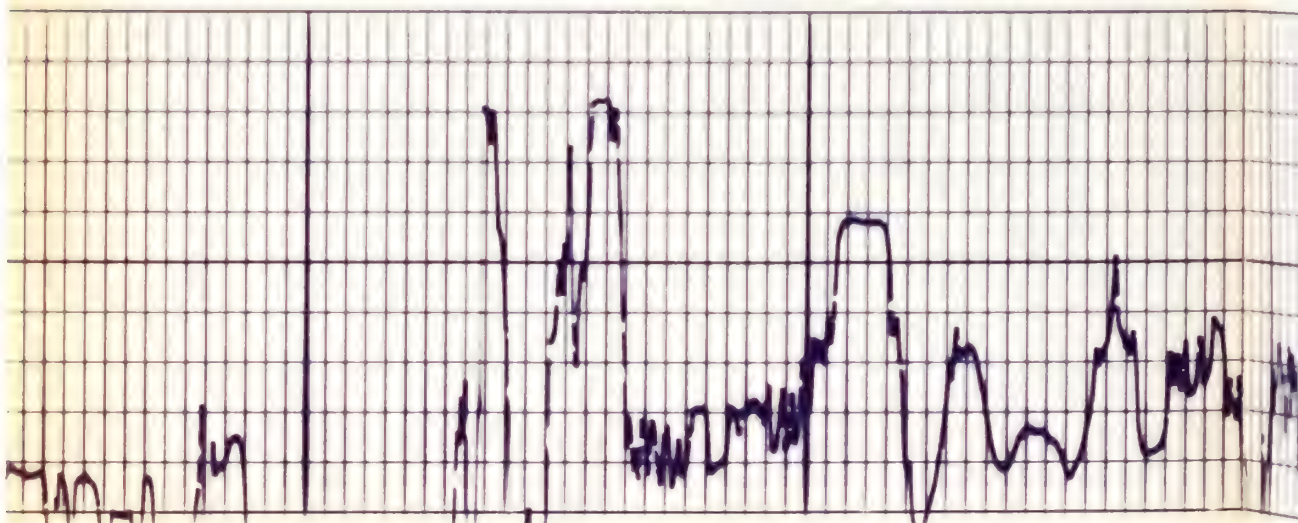
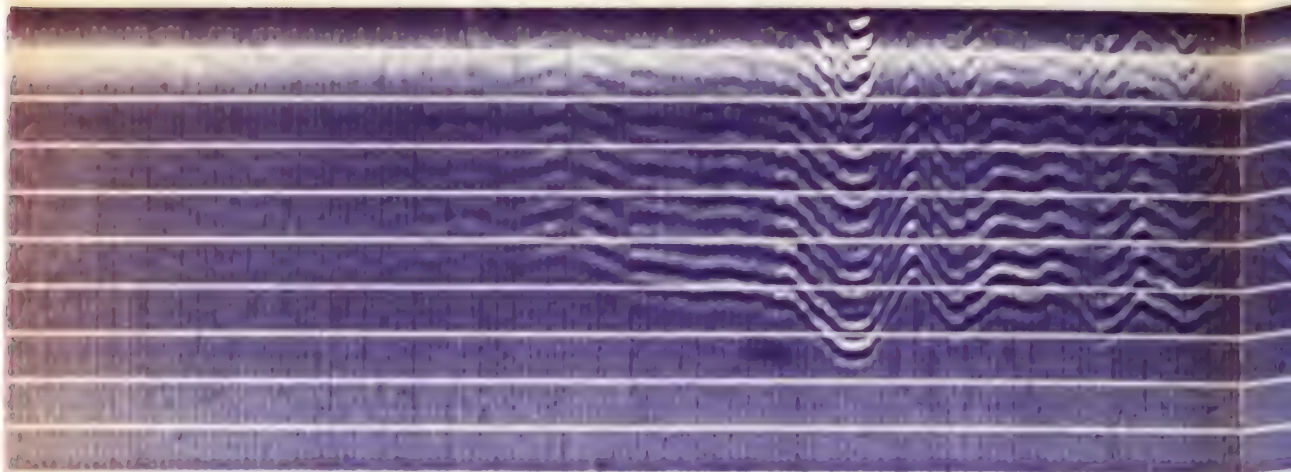
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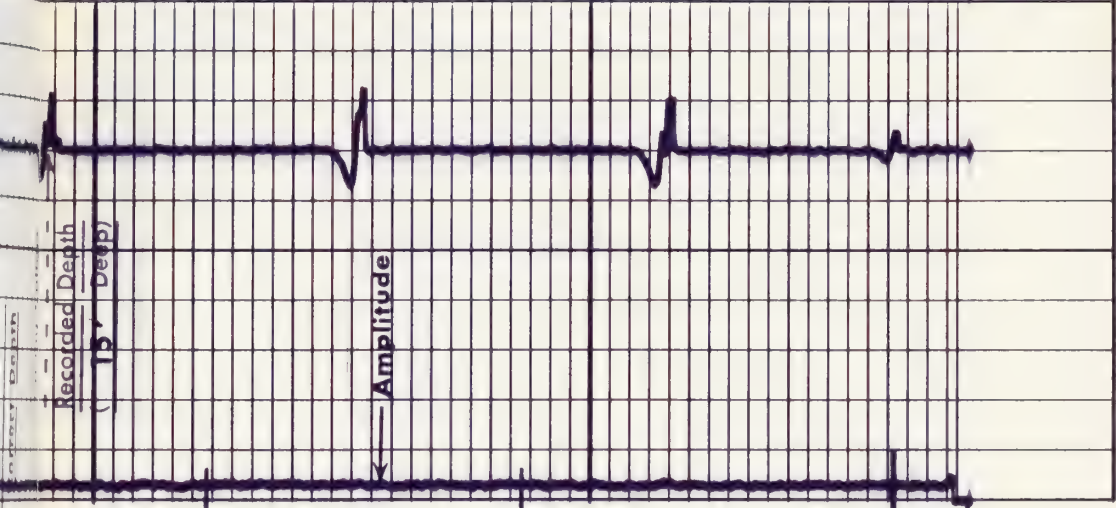
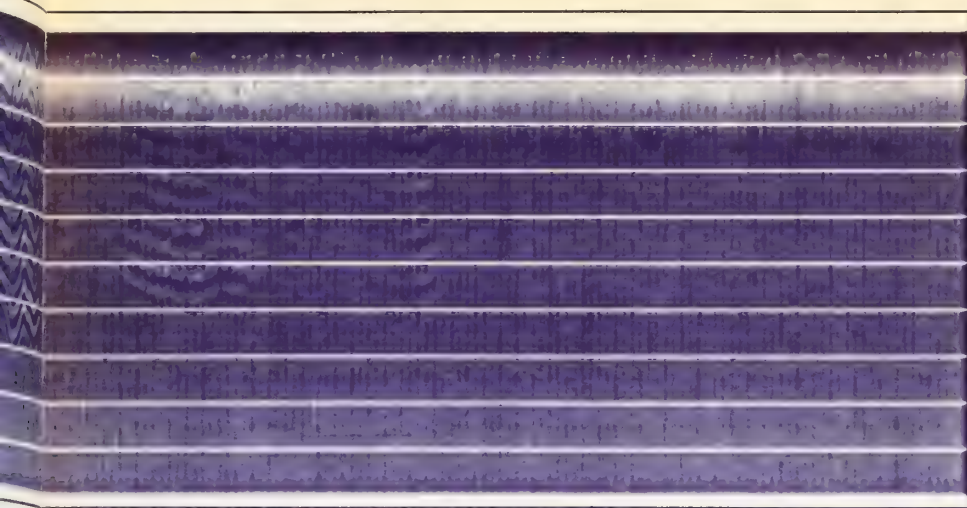






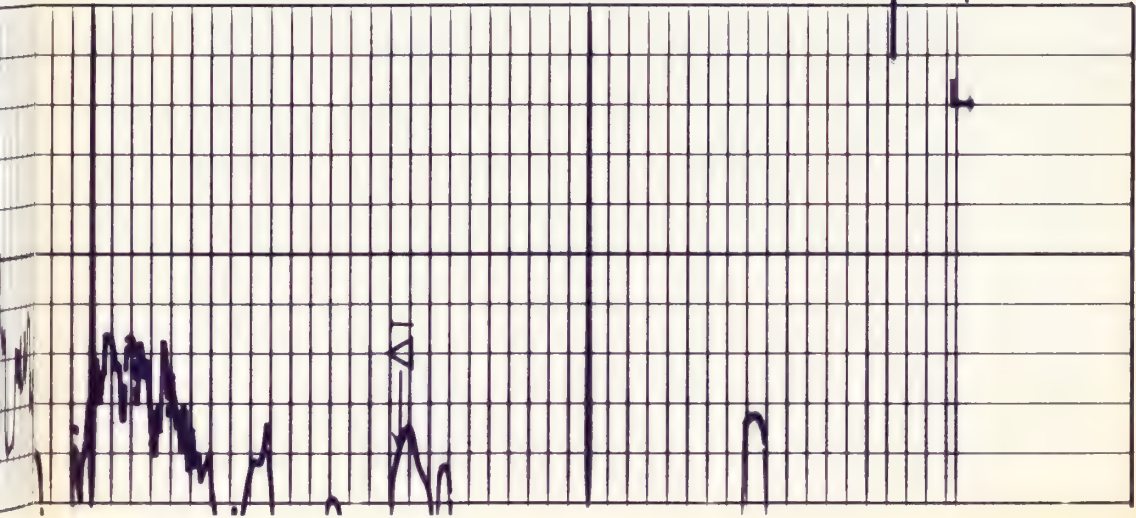




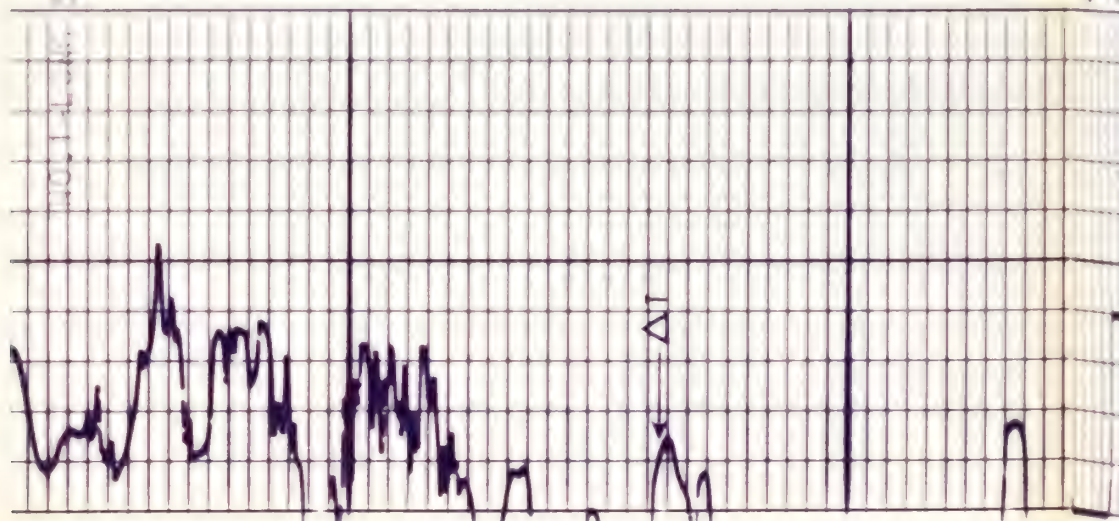
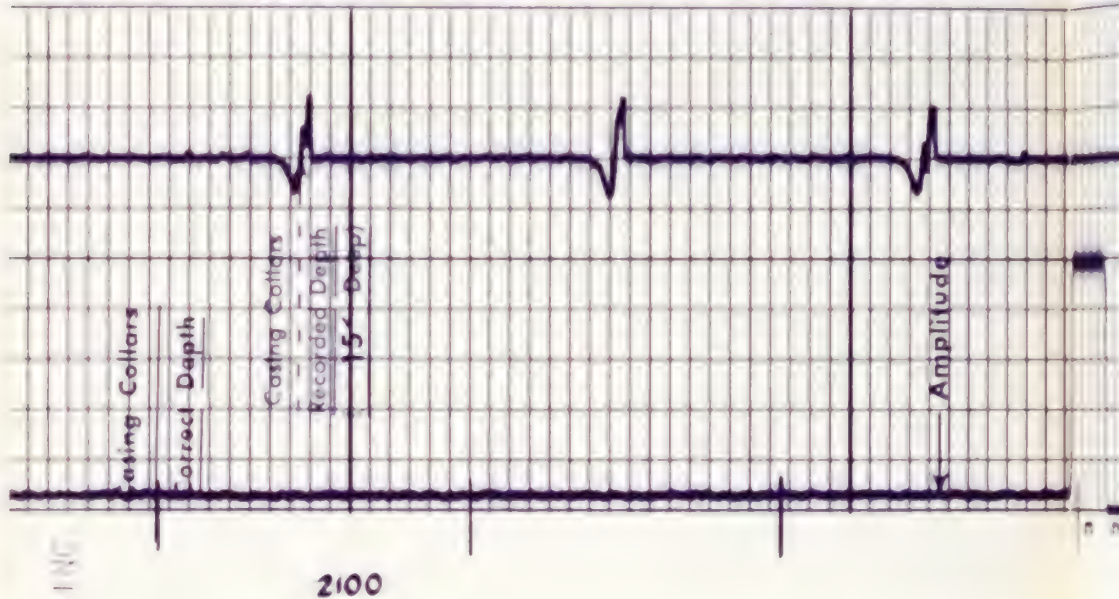
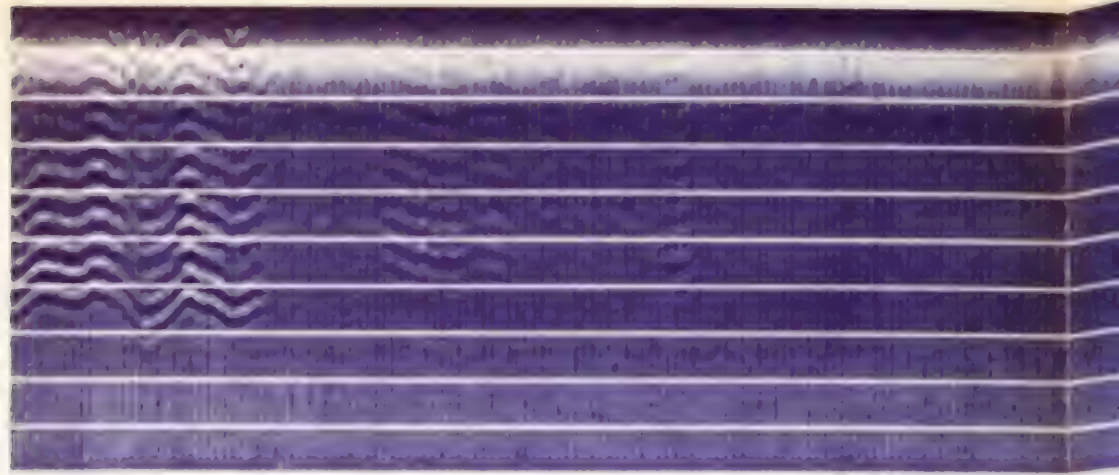


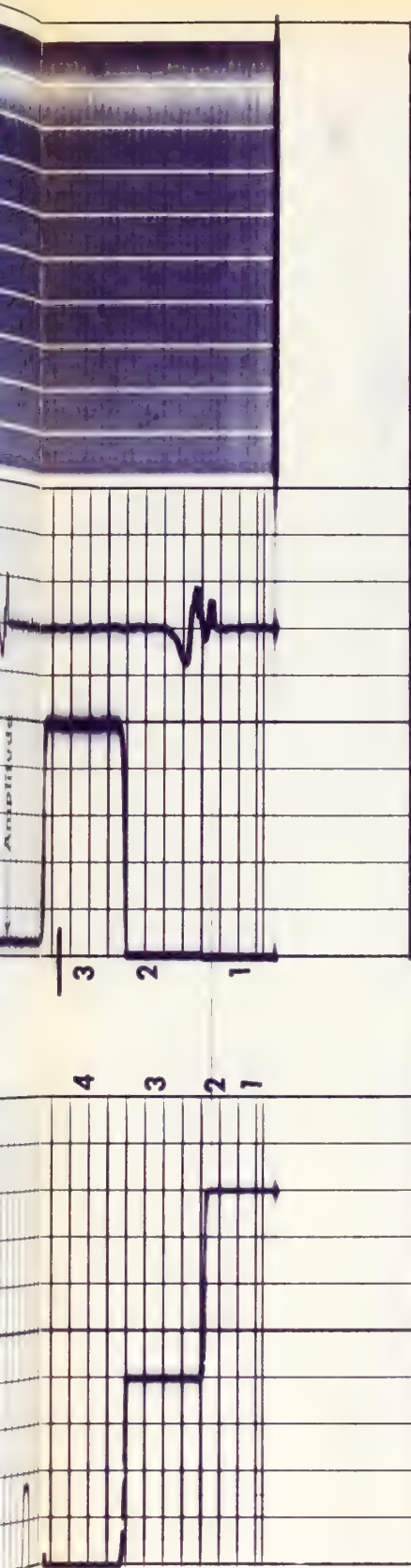
2100

FR



REPEAT SECTION





HERE

| TRANSIT TIME | | CASING BOND | | VARIABLE DENSITY | |
|--------------|--|-----------------|--|------------------|--|
| MICROSECONDS | | MILLIVOLTS | | MICROSECONDS | |
| SPACING | | Corrected Depth | | 5 FT SPACING | |
| 400 | | 0 | | 200 | |
| 200 | | 50 | | 100 | |
| | | | | | |
| | | | | | |
| | | | | | |

| | | | |
|---------|----------------------------|----------|--------|
| COMPANY | ATLANTIC RICHFIELD COMPANY | SCHL. | FR 215 |
| WELL | CLASH, 1 | SCHL. TD | 2151 |
| FIELD | SUPHUR GULCH | DRLR TD | 2406 |
| COUNTY | ALCO | Elev: | |
| STATE | COLORADO | KB | |
| | | DF | |
| | | GL | 64.8 |

CEMENT BOND CALIBRATION CODING

| | Δ | AMPLITUDE | |
|---|-----------------|-----------------|-----------------|
| | | MECHANICAL ZERO | ELECTRICAL ZERO |
| 1 | MECHANICAL ZERO | | |
| 2 | 240 sec | | |
| 3 | 320 sec | | |
| 4 | 400 sec | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

CEMENT BOND LOG

Schlumberger

| | | |
|---|---------------|----------------------|
| COUNTY Field or LOCATION WELL COMPANY | COMPANY _____ | |
| | WELL _____ | |
| | FIELD _____ | |
| | COUNTY _____ | STATE _____ |
| LOCATION _____ | | API Serial No. _____ |
| Sec. _____ Twp. _____ | | Rge. _____ |
| Other Services: _____ | | |

| | |
|--|-------------------|
| Permanent Datum: _____, Elev. _____ | Elev.: K.B. _____ |
| Log Measured From _____, _____ Ft. Above Perm. Datum | D.F. _____ |
| Drilling Measured From _____ | G.L. _____ |

| | |
|-------------------------|--------------------------|
| Date _____ | Type Drill Fluid _____ |
| Run No. _____ | Fluid Level _____ |
| Depth — Driller _____ | Max. Rec. Temp. _____ °F |
| Depth — Logger _____ | Est. Cement Top _____ |
| Btm. Log Interval _____ | Equip. Location _____ |
| Top Log Interval _____ | Recorded By _____ |
| Open Hole Size _____ | Witnessed By _____ |

| CASING REC. | Size | Wt/Ft | Grade | Type Joint | Top | Bottom |
|----------------|------|-------|-------|------------|-----|--------|
| Surface String | | | | | | |
| String | | | | | | |
| String | | 4.7 | | T- | | |
| Liner | | | | | | |

| PRIMARY CEMENTING DATA | | | | |
|------------------------|---------|------------|------------|-------|
| STRING | Surface | Protection | Production | Liner |
| Vol. of cement | | | | |
| Type of cement | | | | |
| Additive | | | | |
| Retarder | | | | |
| Wt. of slurry | | | | |
| Water loss | | | | |
| Type fluid in csg. | | | | |
| Fluid wt. | | | | |

The well name, location and borehole reference data were furnished by the owner.

K-100-1000

| PRIMARY CEMENTING PROCEDURE | | | REMARKS | |
|-----------------------------|--------------|-------------------------------|---|------------------|
| Hour — date | | Hours from start of operation | Service Order No. 5127 Csg. Collars Recorded 1 cft | |
| Started pumping cement | | | | |
| Released pressure | | | | |
| Start Cement Bond Log | | | | |
| Finish Cement Bond Log | | | | |
| Preceding fluid | Volume bbls | | Pipe reciprocated during Pumping: Yes No | |
| Cement pumped | bbls./minute | | Pipe reciprocated after plug down: Yes min. No | |
| SQUEEZE JOB DETAIL | | | EQUIPMENT DATA | Scratcher Depths |
| Squeeze number | 1 | 2 | Sanic Panel No. | |
| Date | | | Sanic Cart No. | |
| Depth interval | | | Sanic Sonde No. | |
| Type cement | | | CRP No. | |
| Volume of cement | | | Main Panel No. | |
| Additive | | | GR Panel No. | |
| Retarder | | | GR Cart No. | |
| Weight of slurry | | | Centralizer Type | |
| Preceding fluid | | | No. | |
| Breakdown pressure | | | To level (MV) | |
| Max. pressure-stage 1 | | | Cart Gain | |
| " " 2 | | | CRP Intensity | |
| " " 3 | | | R9G Intensity | |
| Final maximum pressure | | | Logging Speed | |
| | | | Time Constant | |
| Started pumping cement | | | | |
| Released pressure | | | | |
| Start CBL | | | | |
| Finish CBL | | | | |
| AVERAGE WELL DRIFT: | | | | |
| from | to | | | |
| TRANSIT TIME | | | CASING BOND | VARIABLE DENSITY |

TRANSIT TIME

MICROSECONDS 400 200 SPACING

DEPTH

CASING BOND

MILLIVOLTS

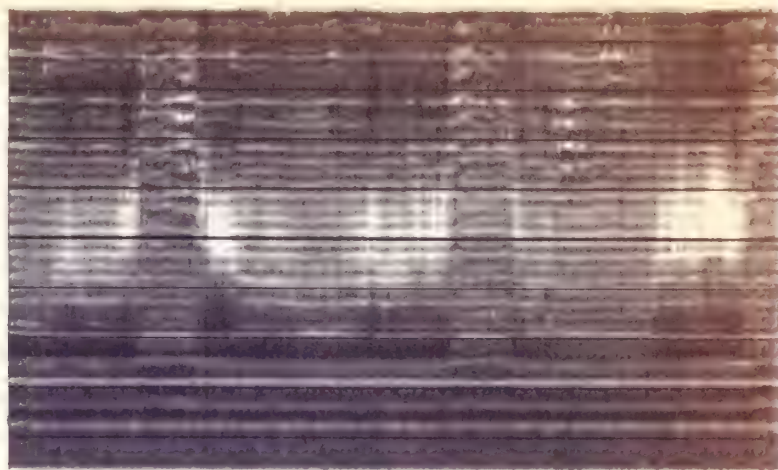
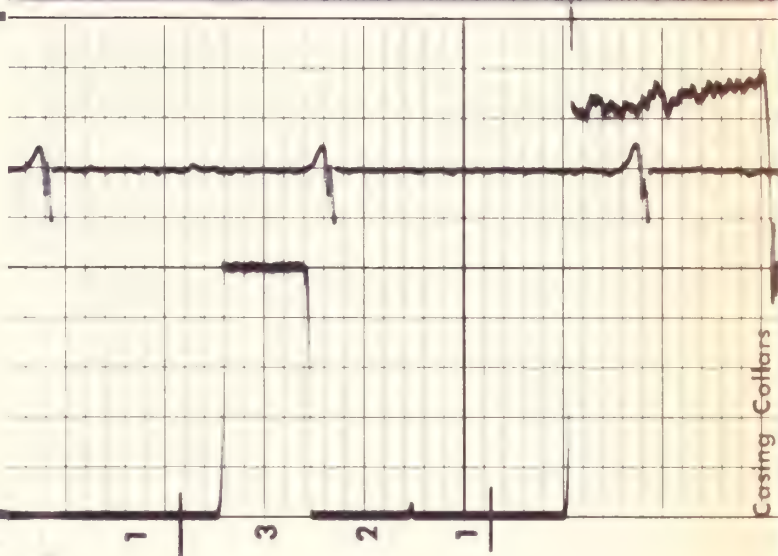
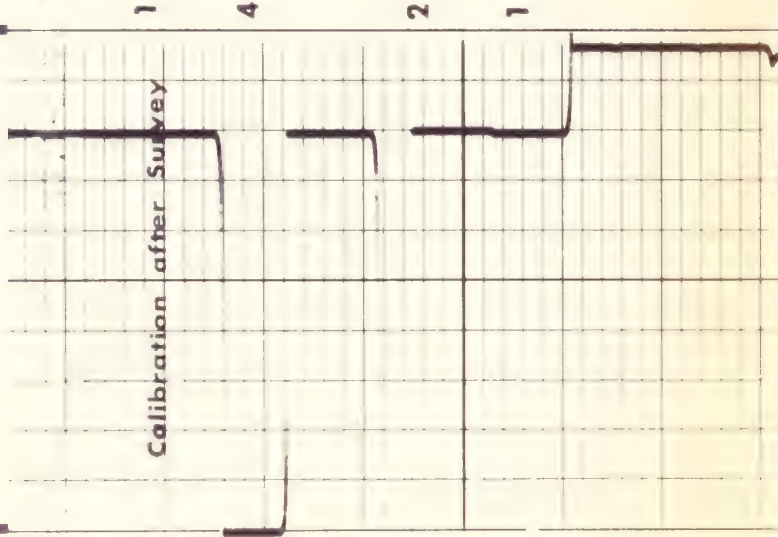
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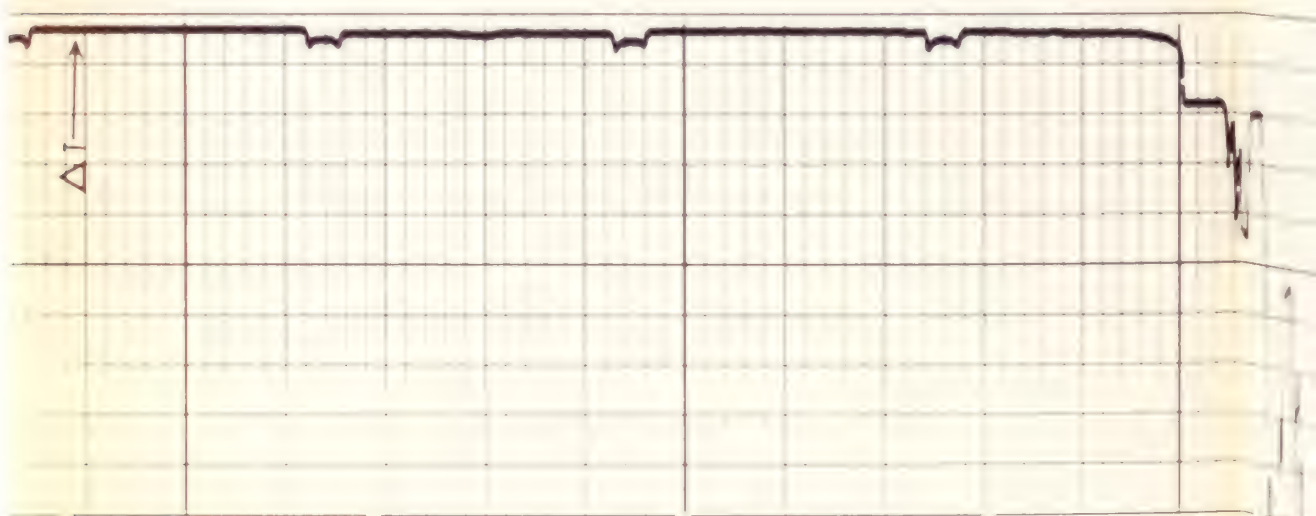
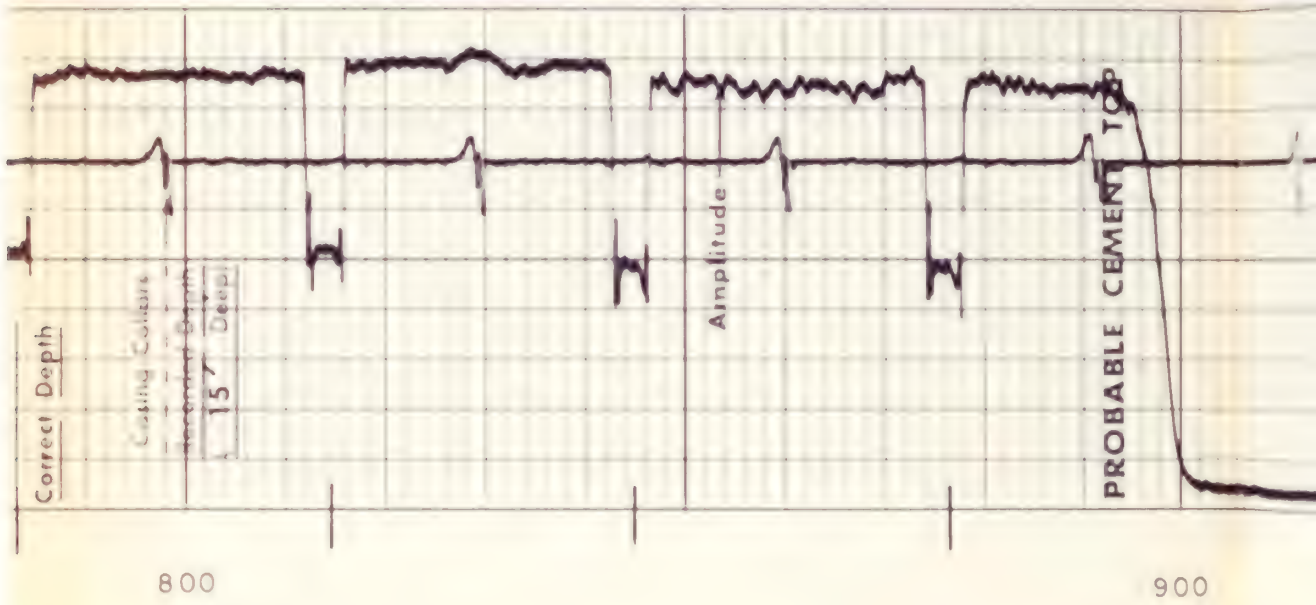
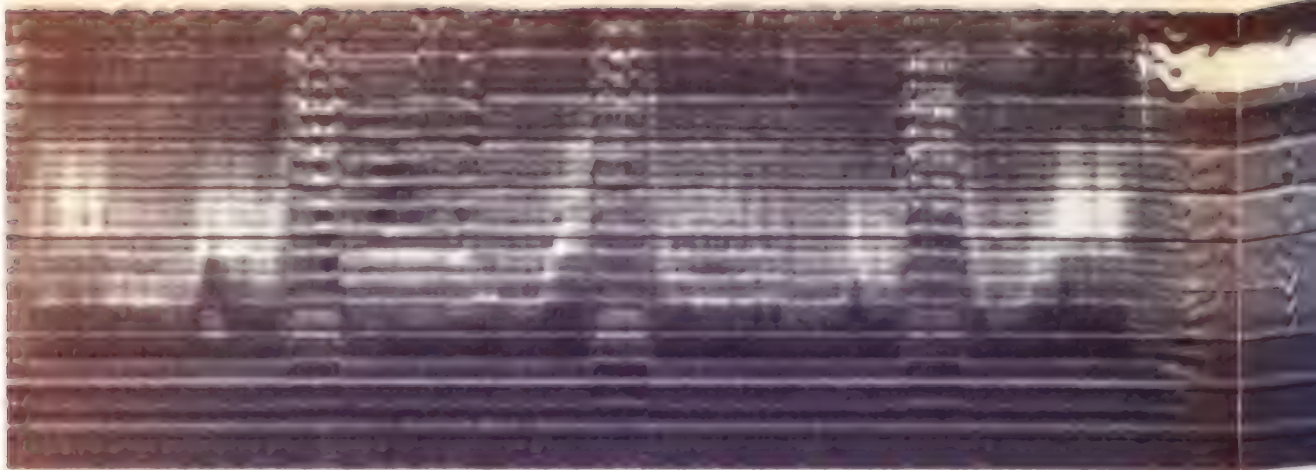
VARIABLE DENSITY

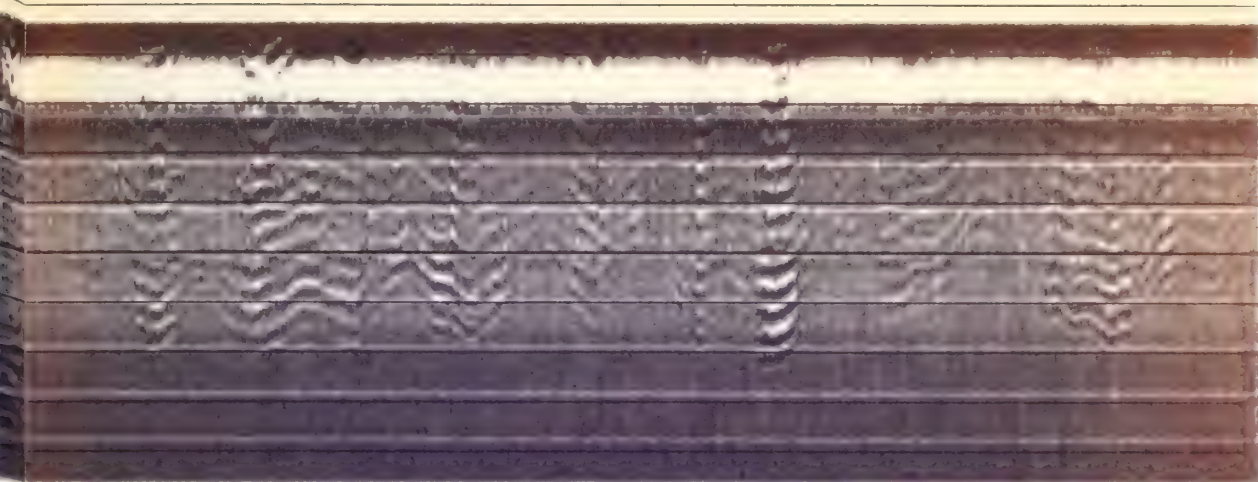
MICROSECONDS SPACING

0 1

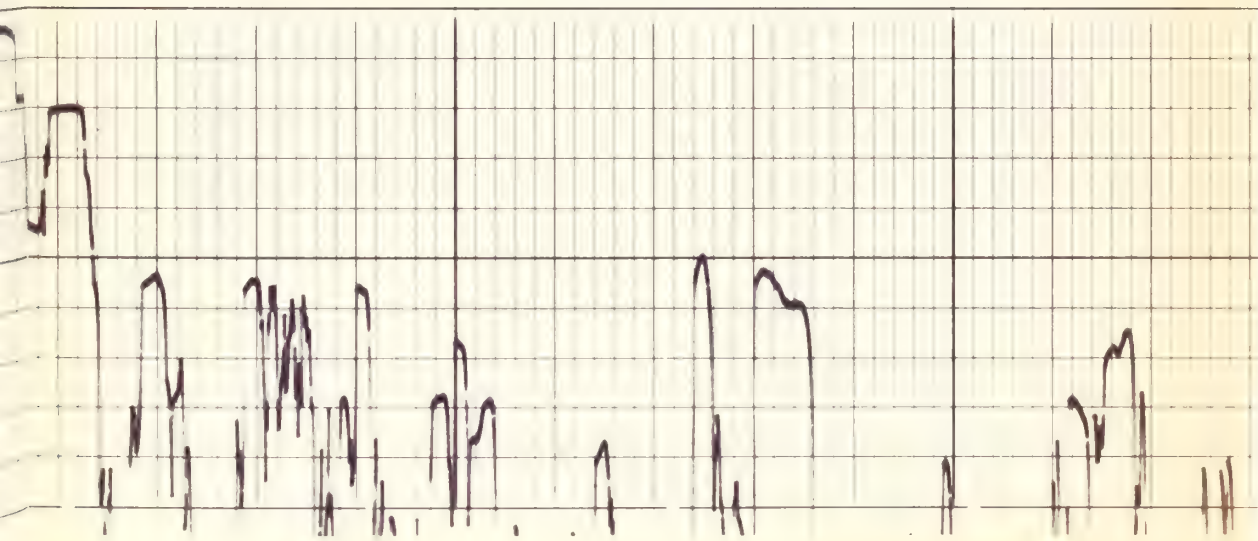
Casing Collars
Corrected Depth

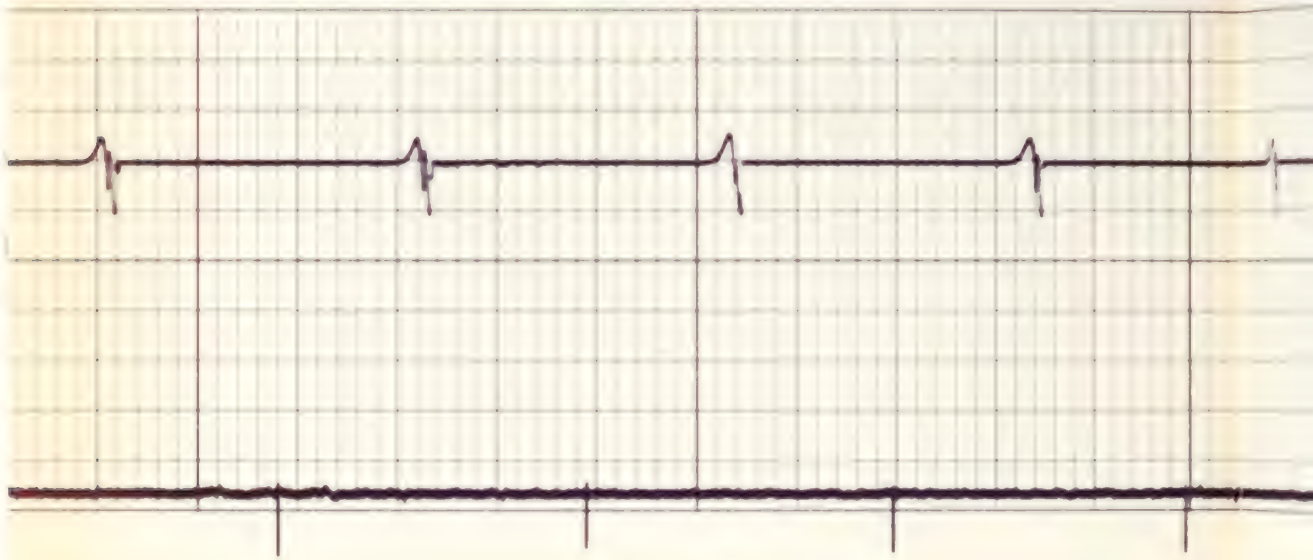




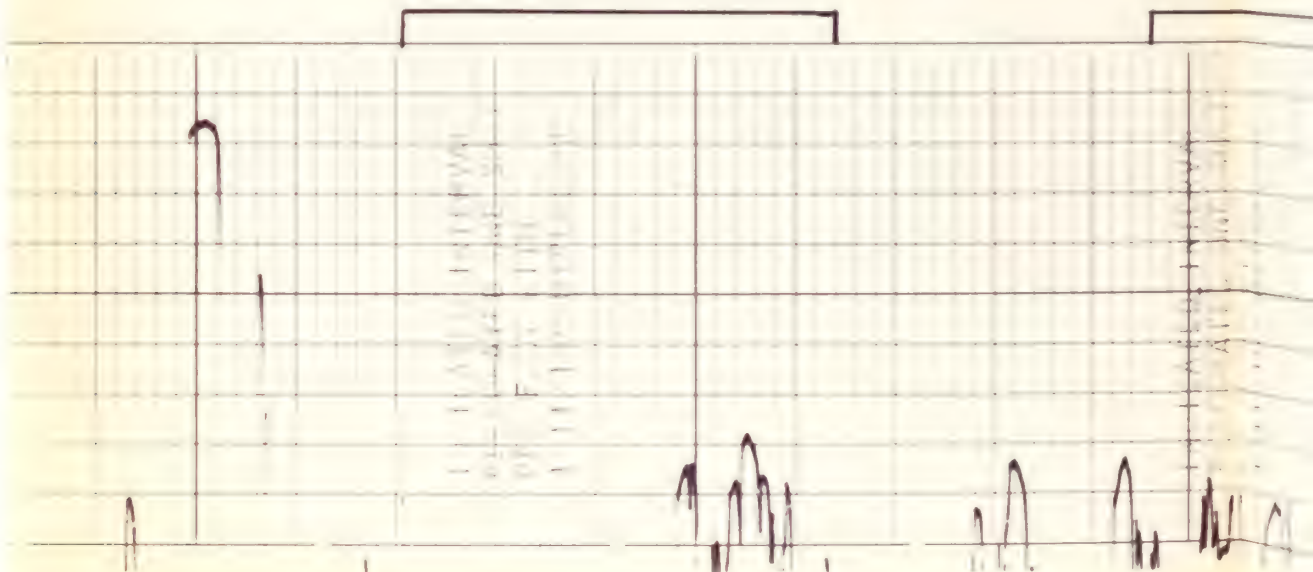


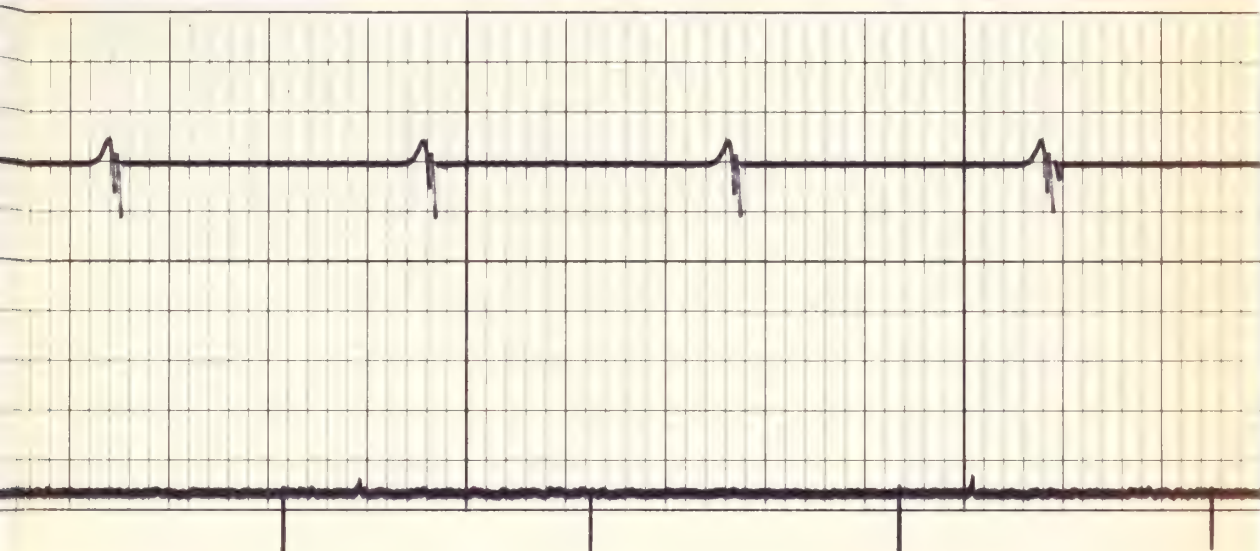
1000



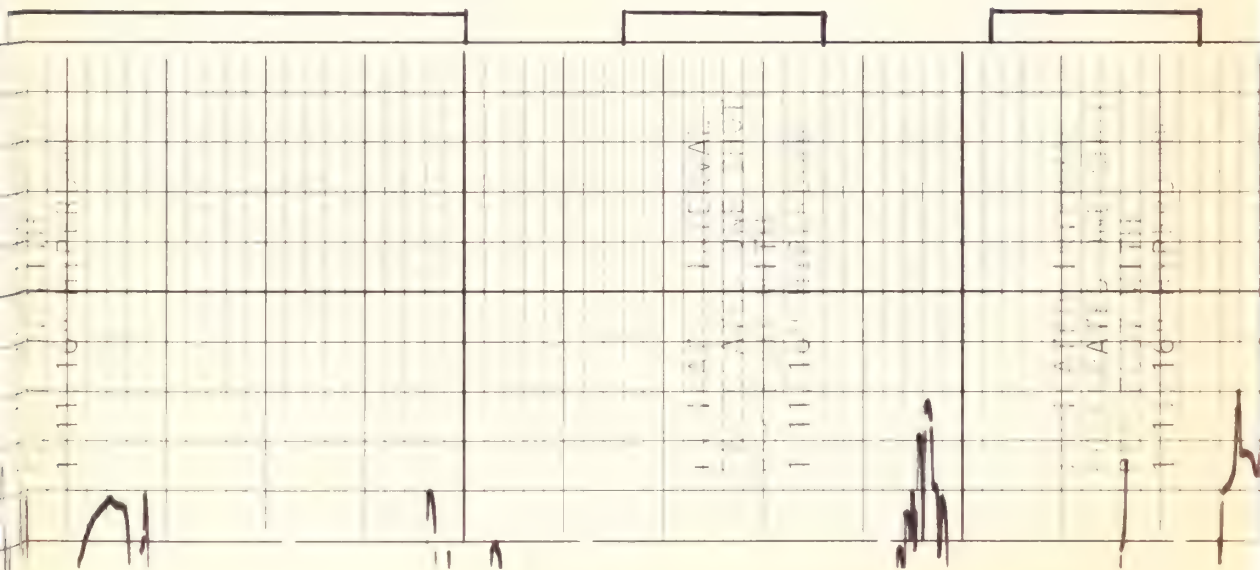


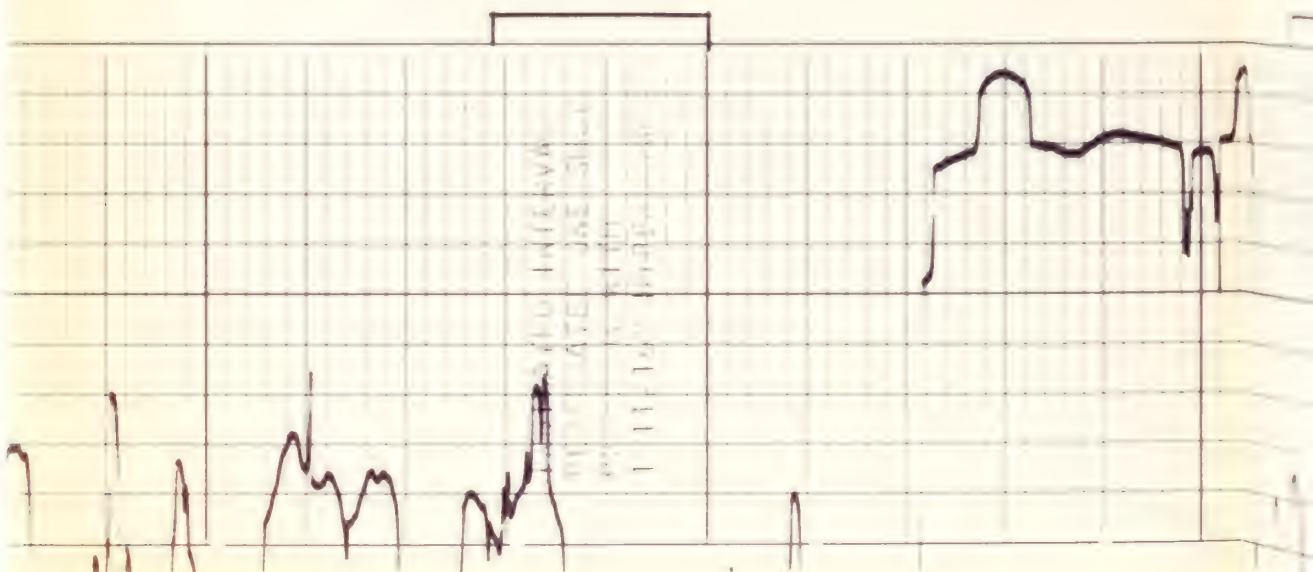
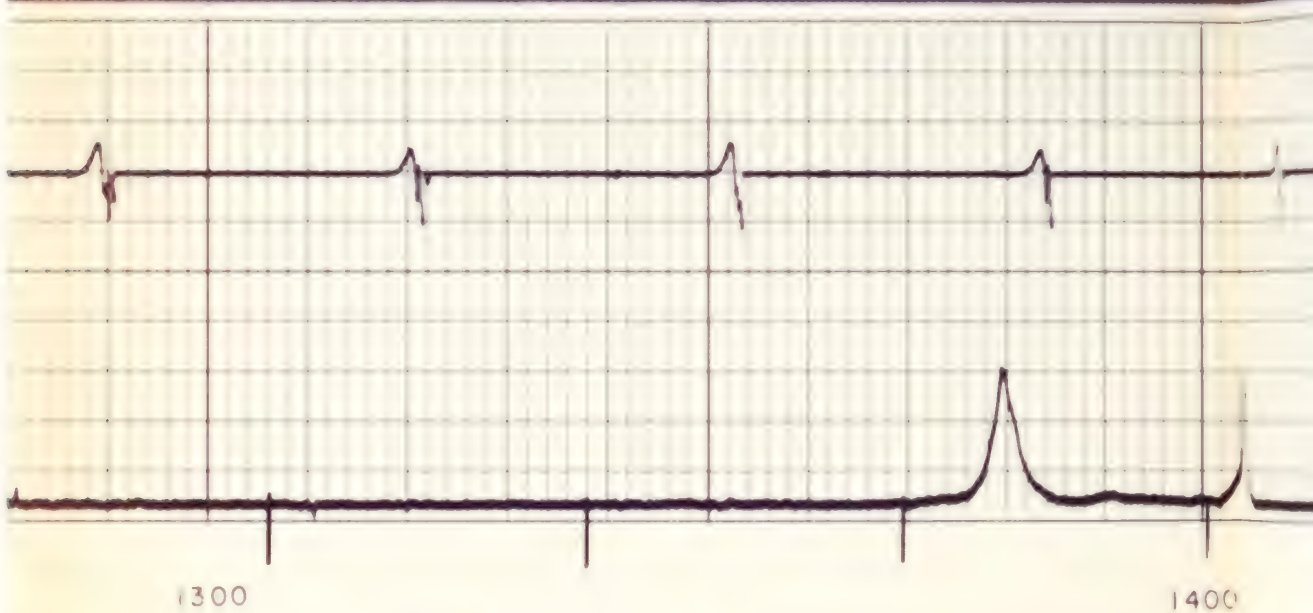
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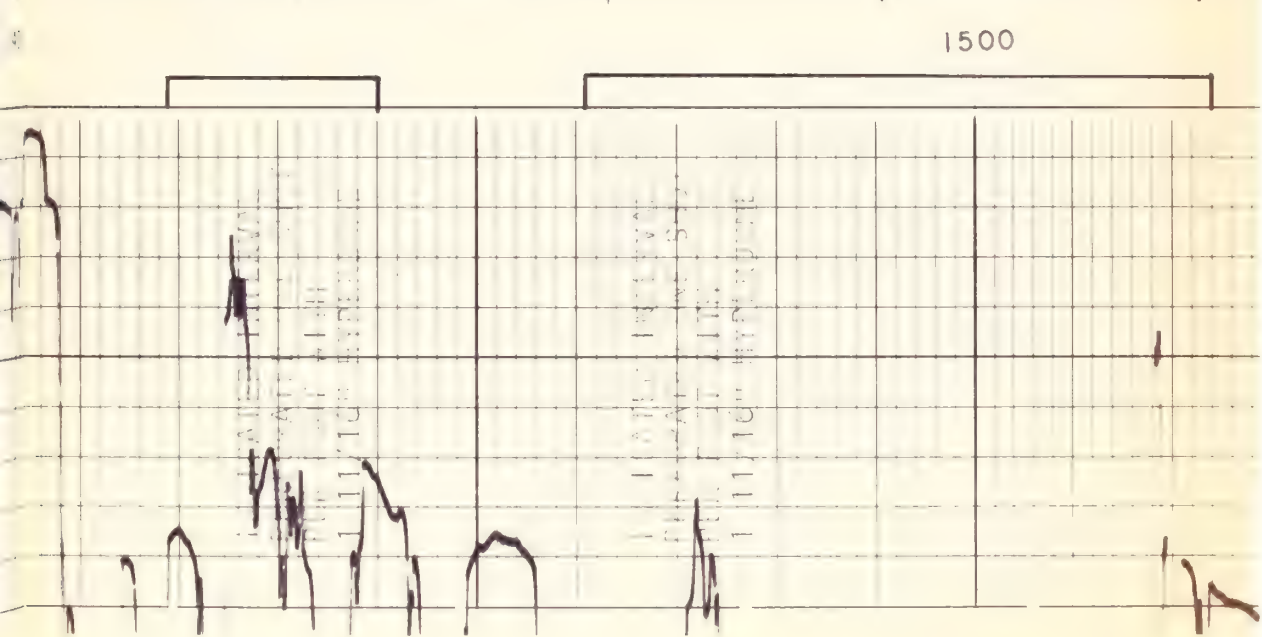
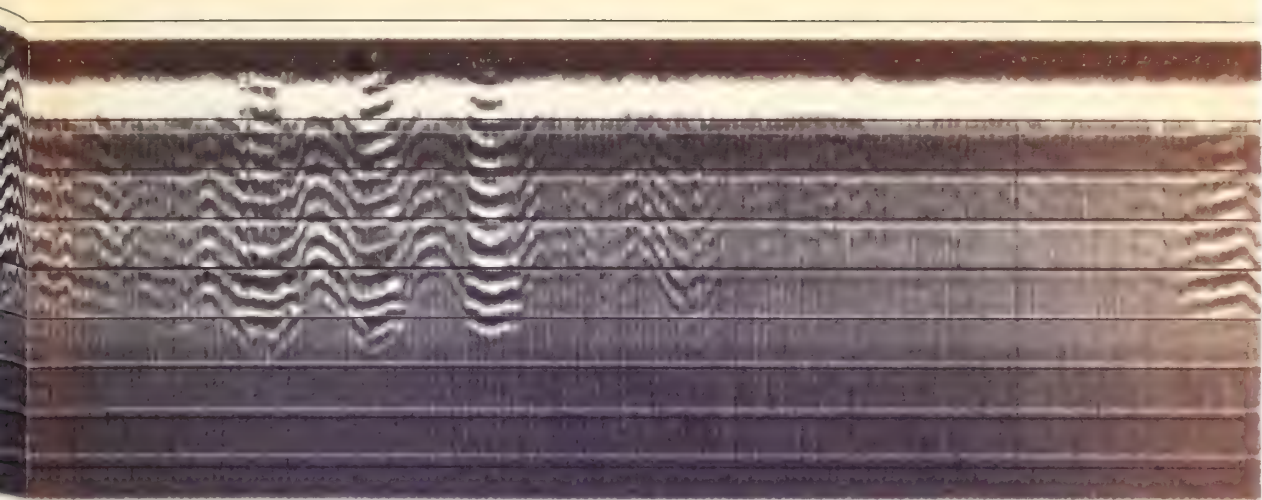


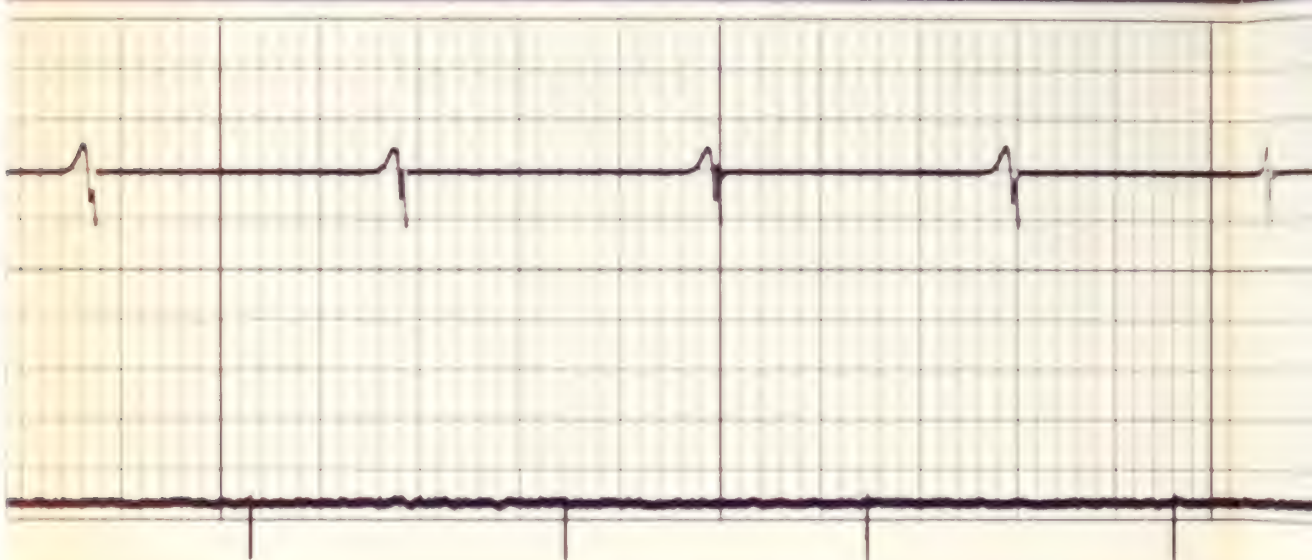
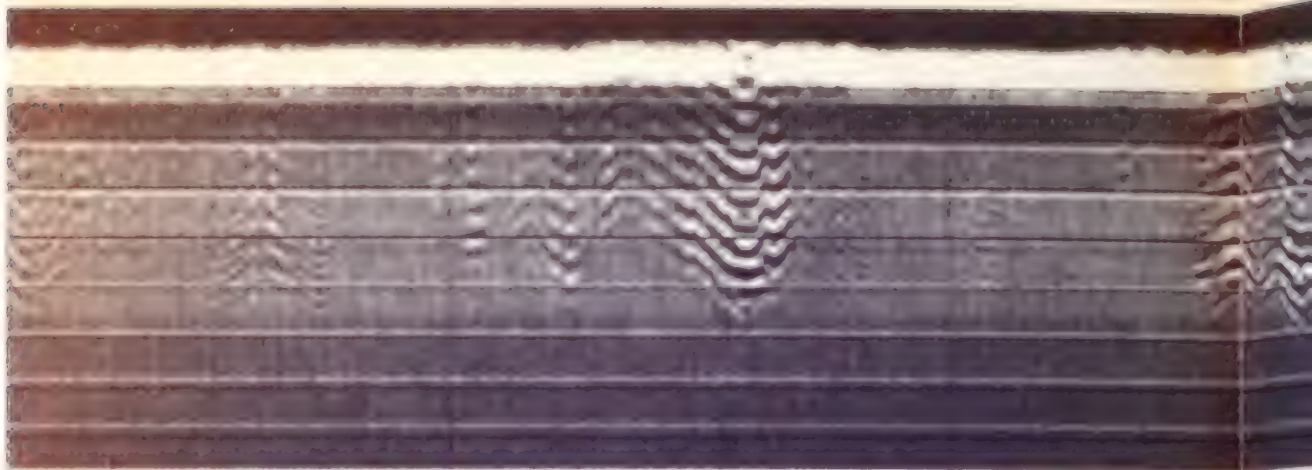


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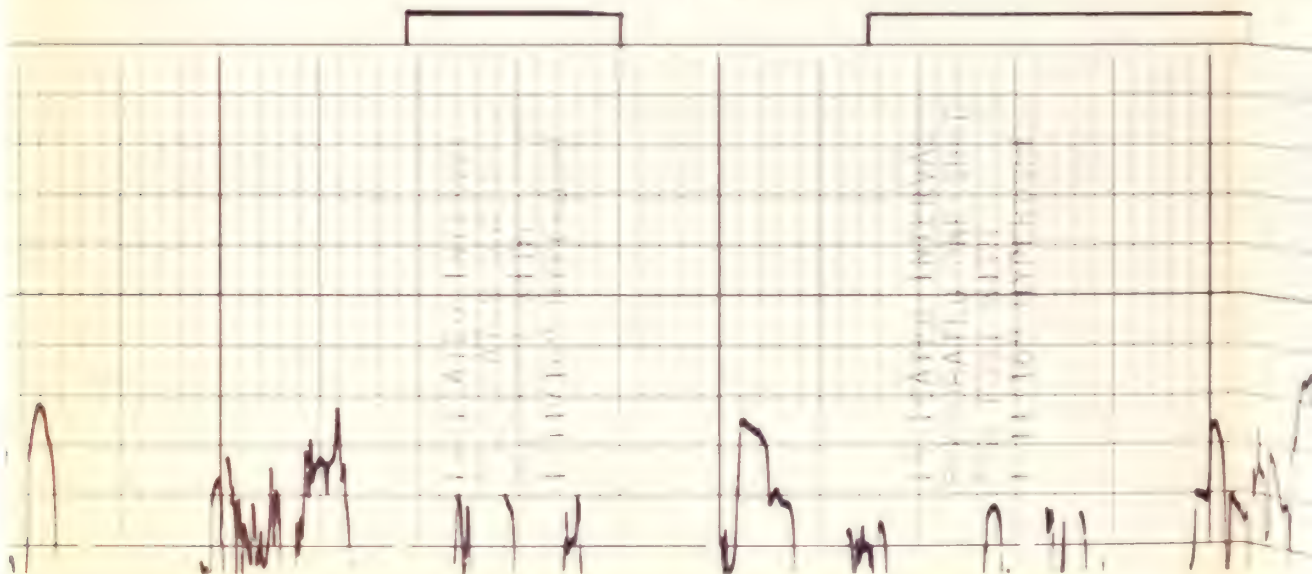


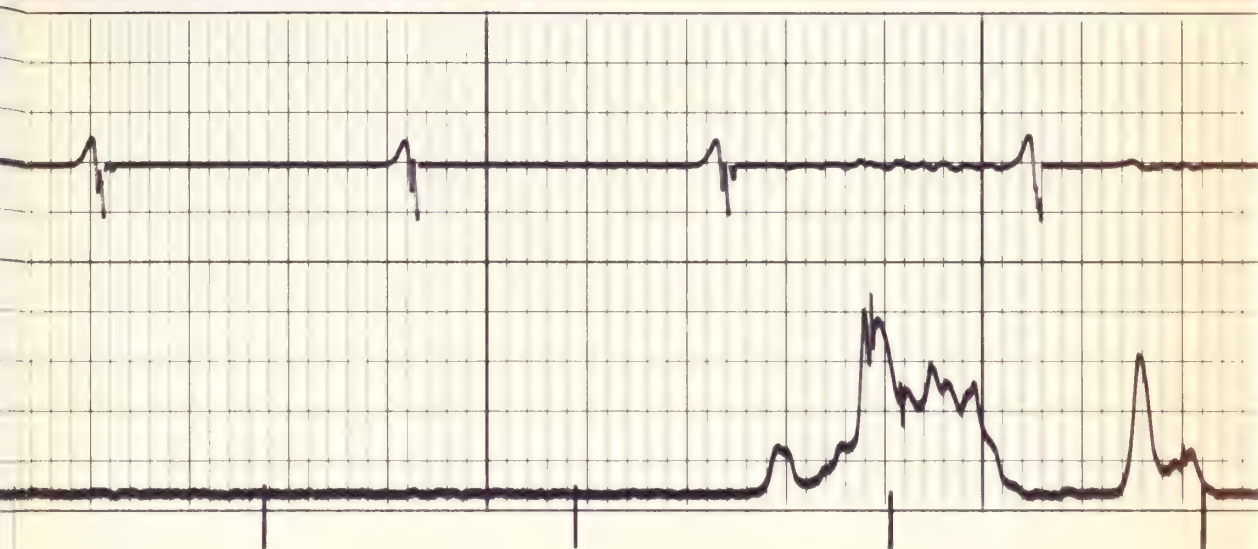
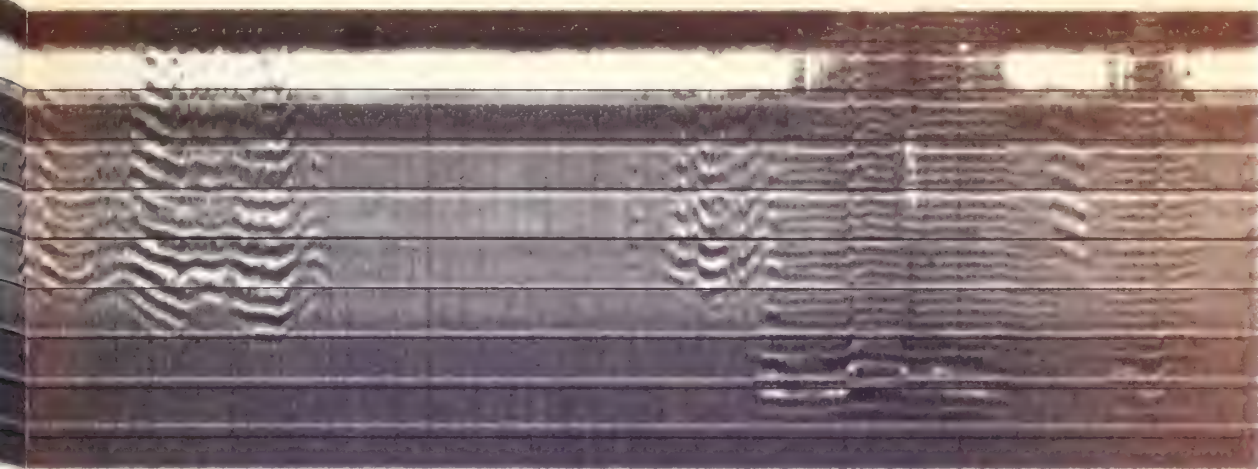




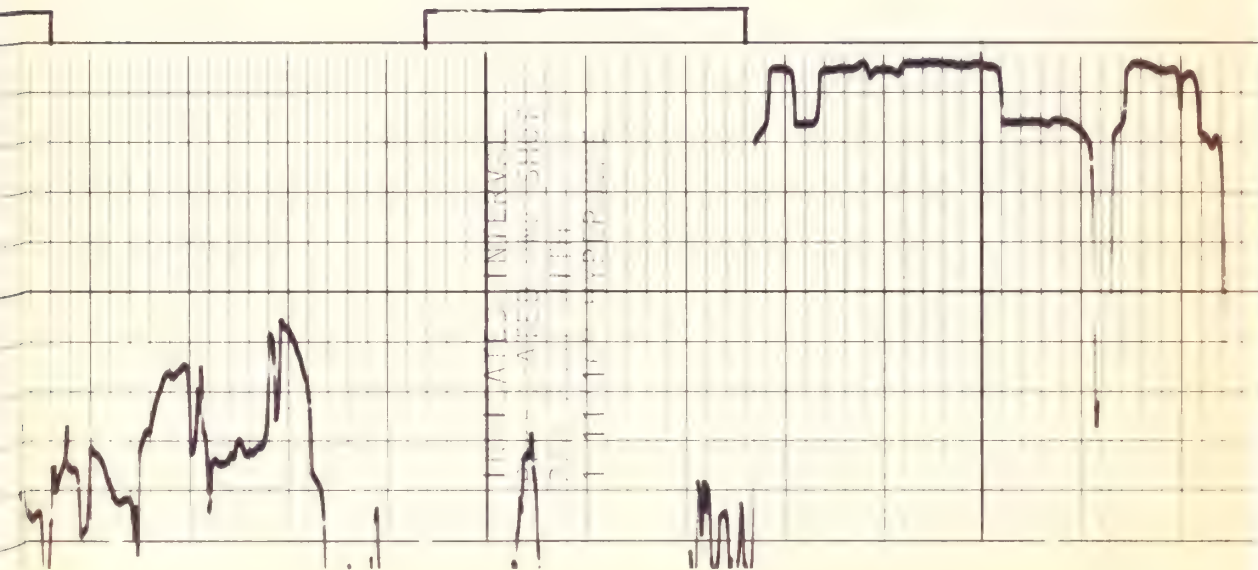


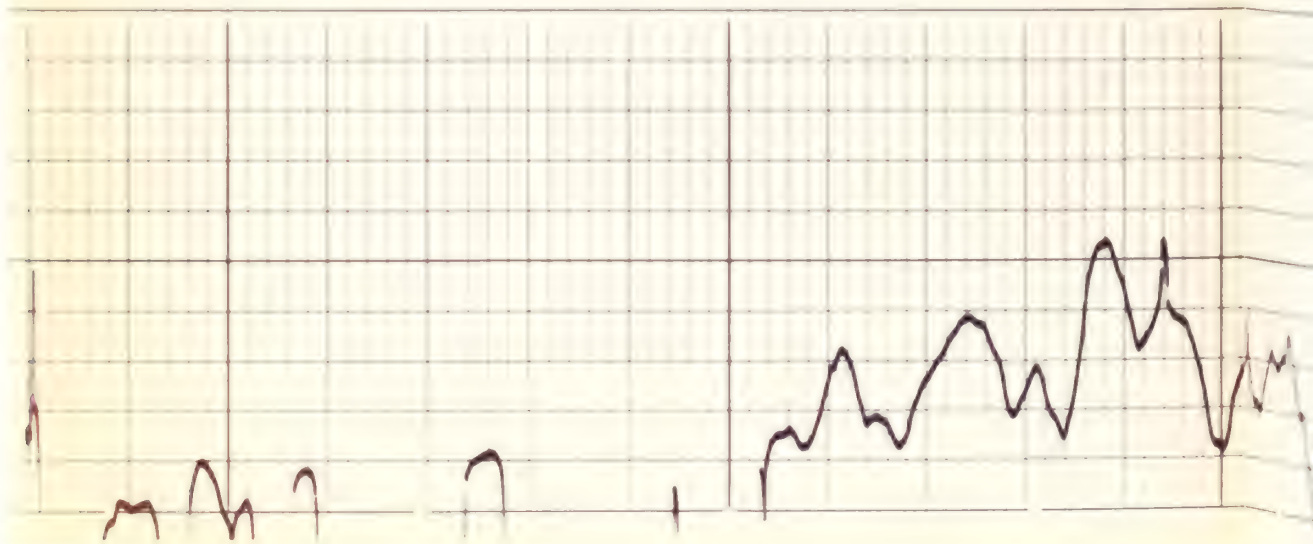
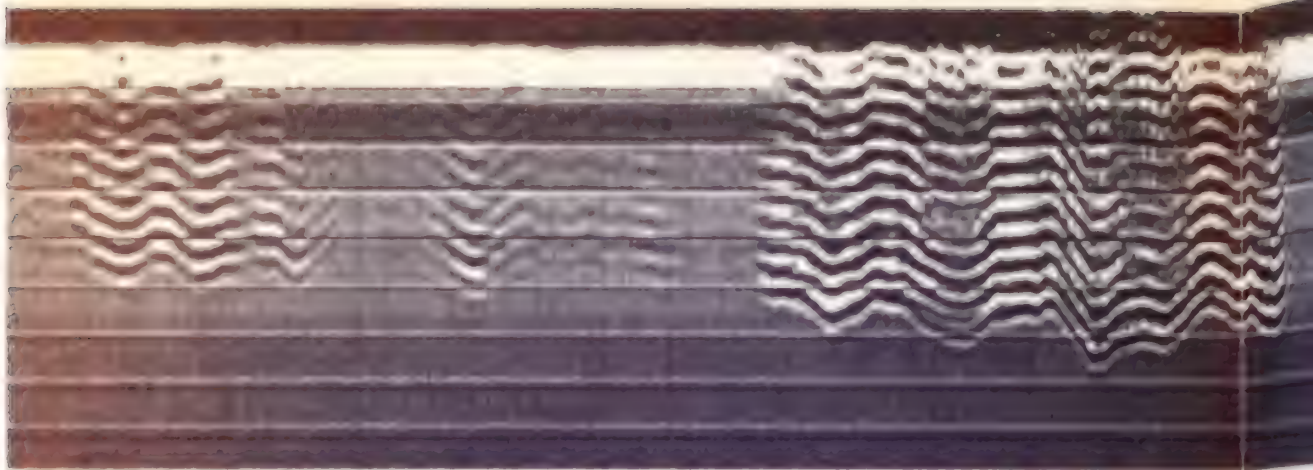
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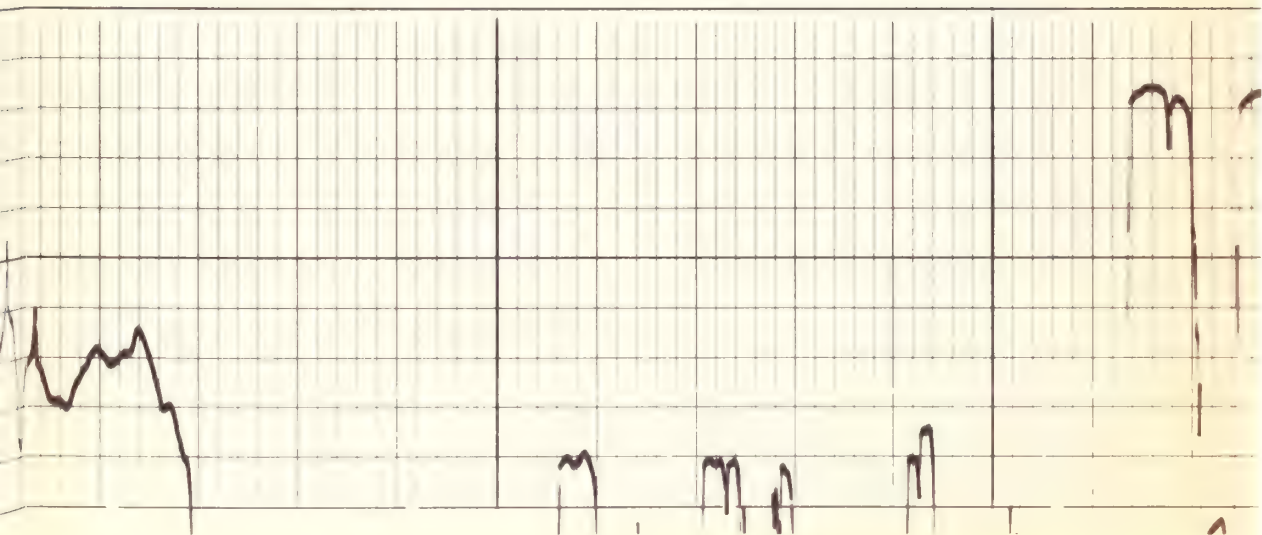
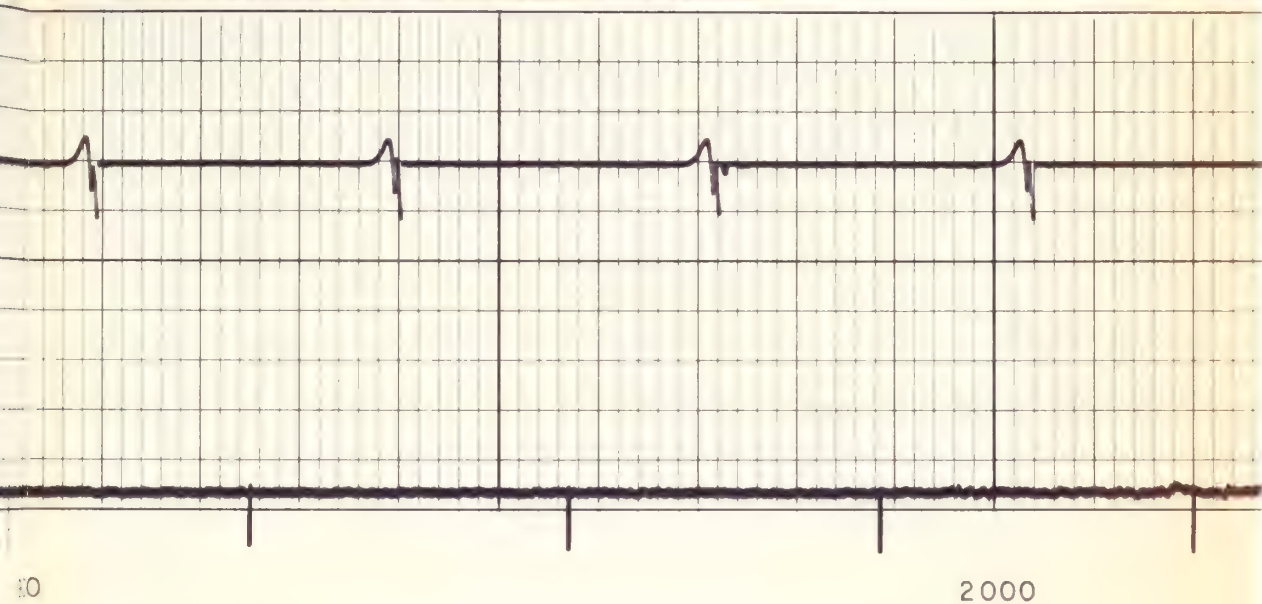


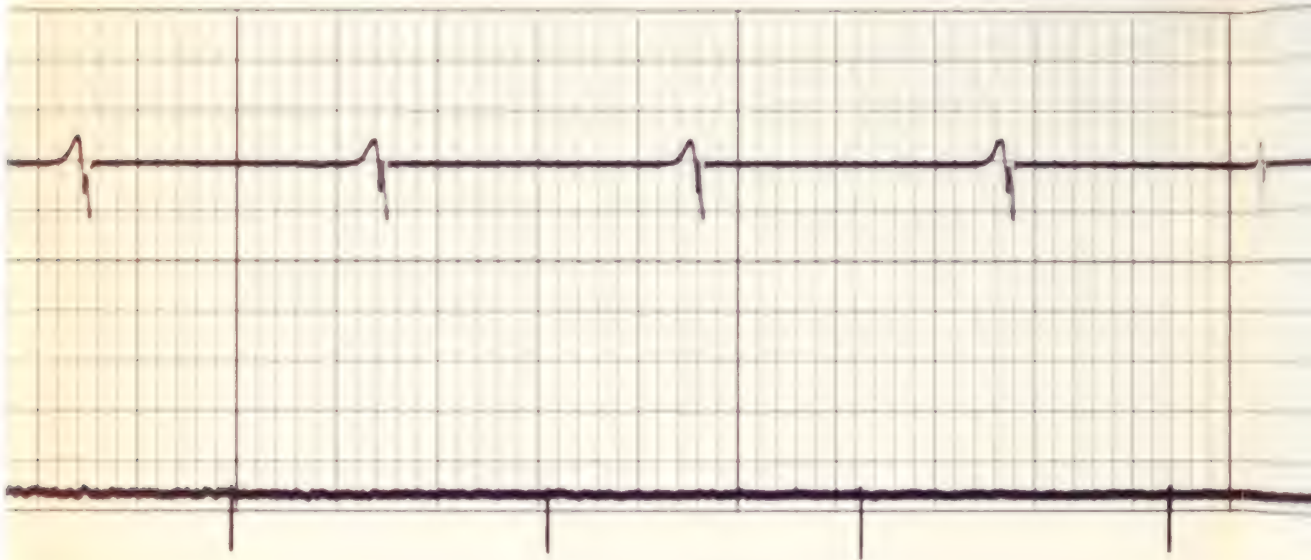
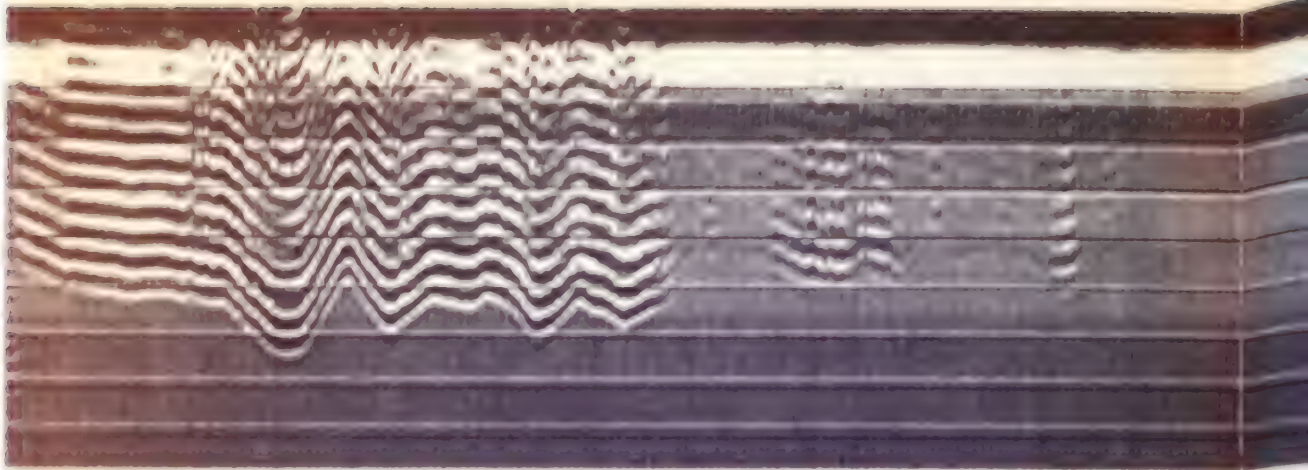


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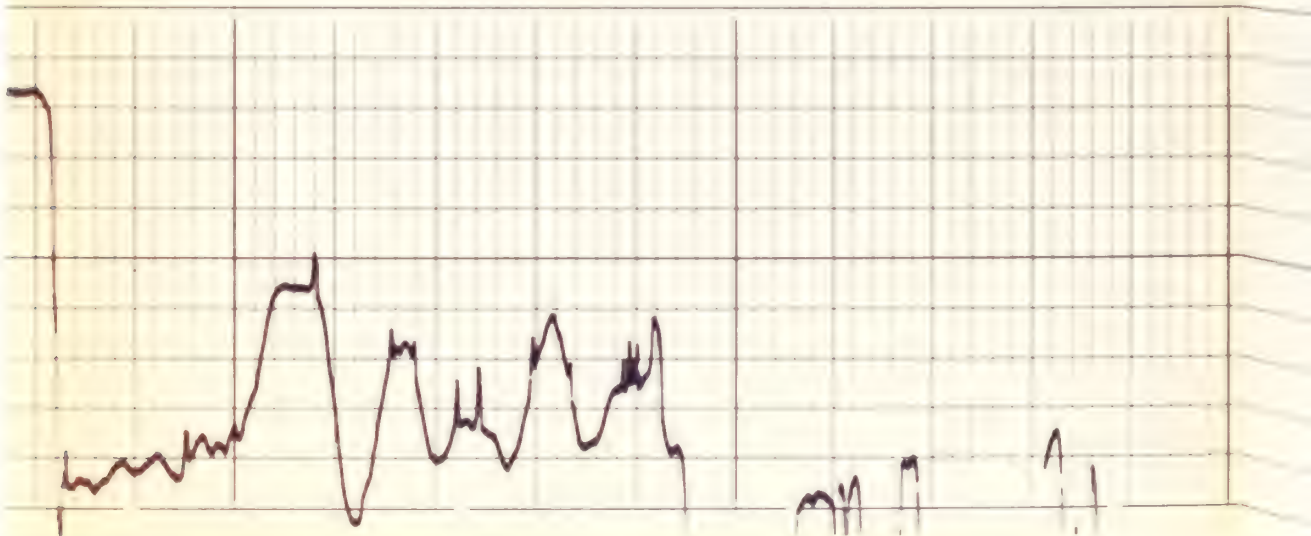


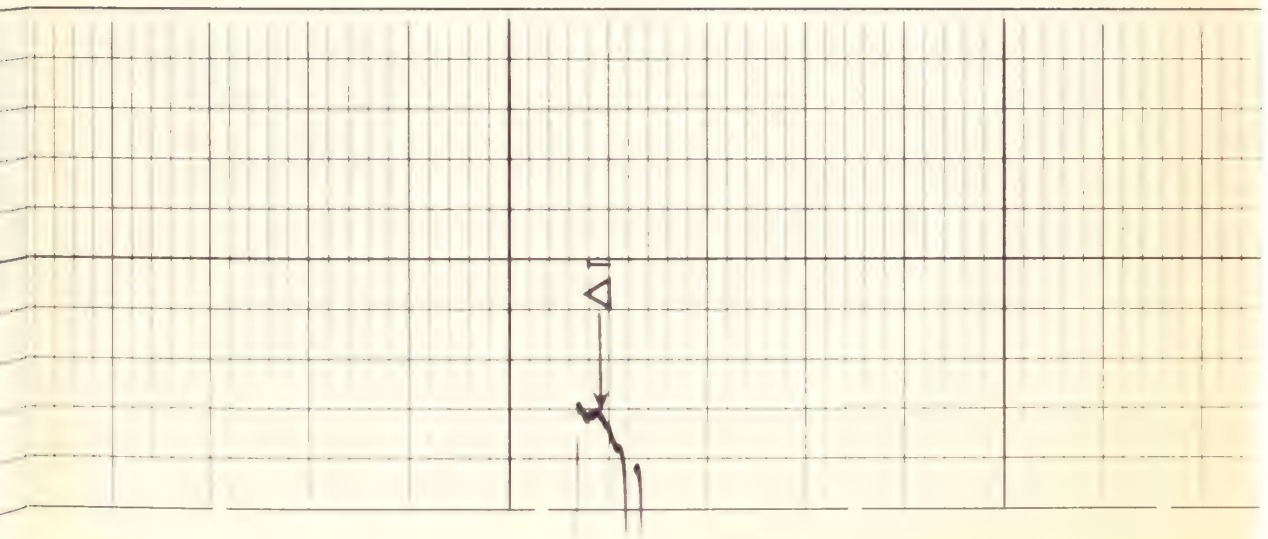


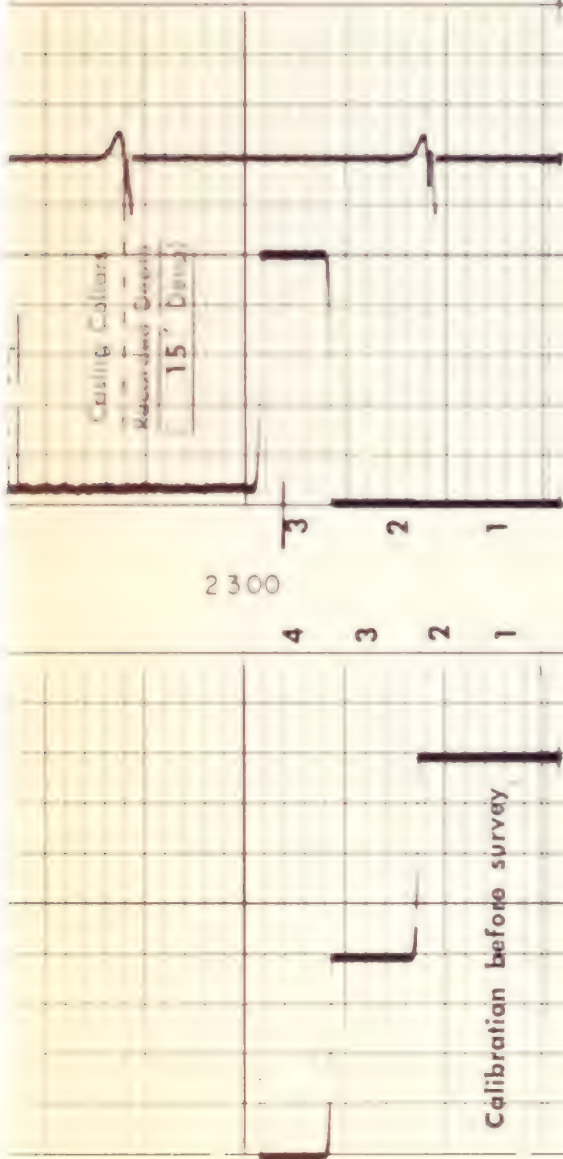




2100







SWS-730-D

[illegible]

TRANSIT TIME
MICROSECONDS

400

200

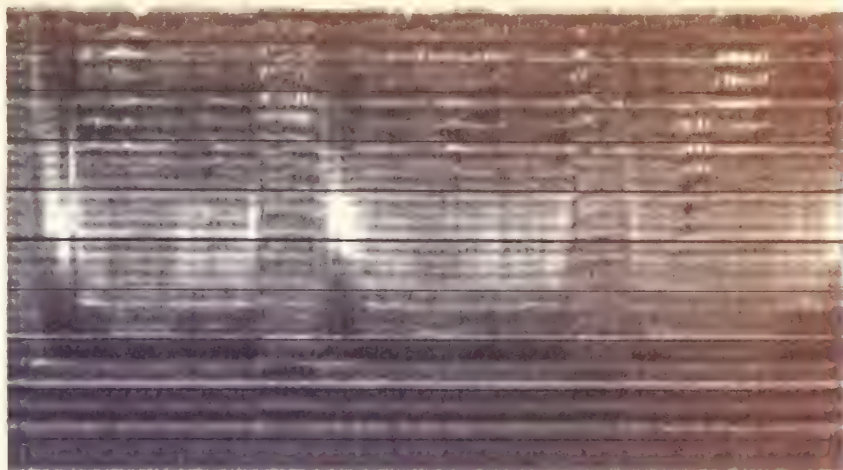
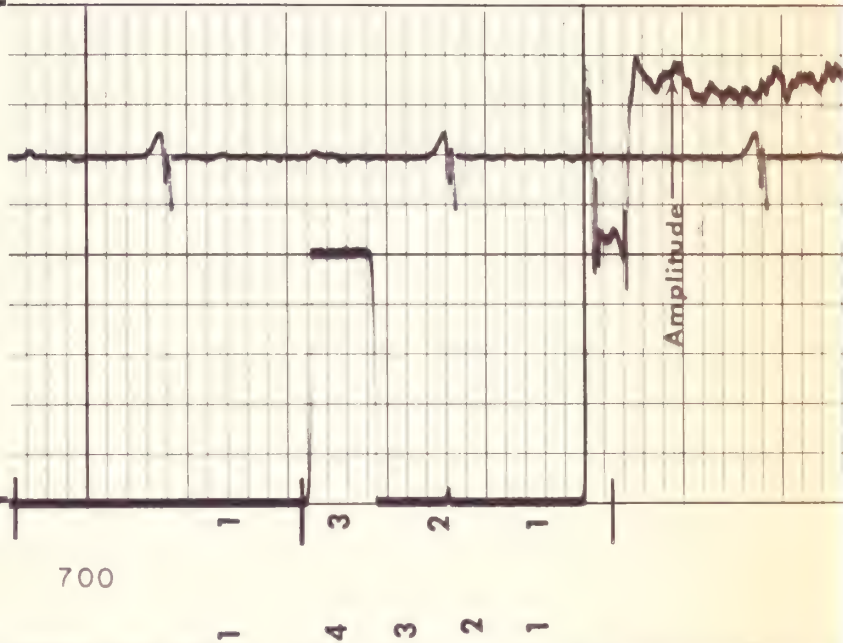
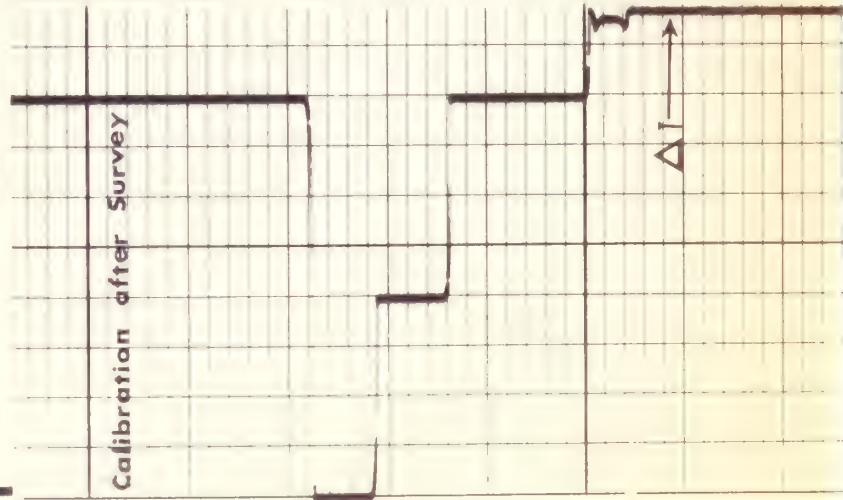
DEPTHS

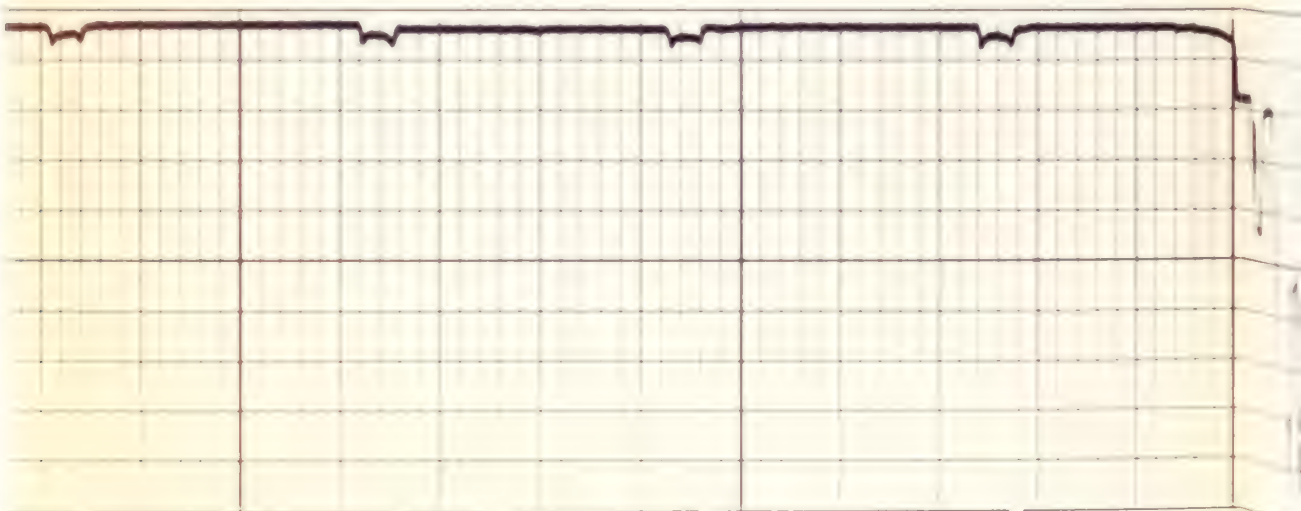
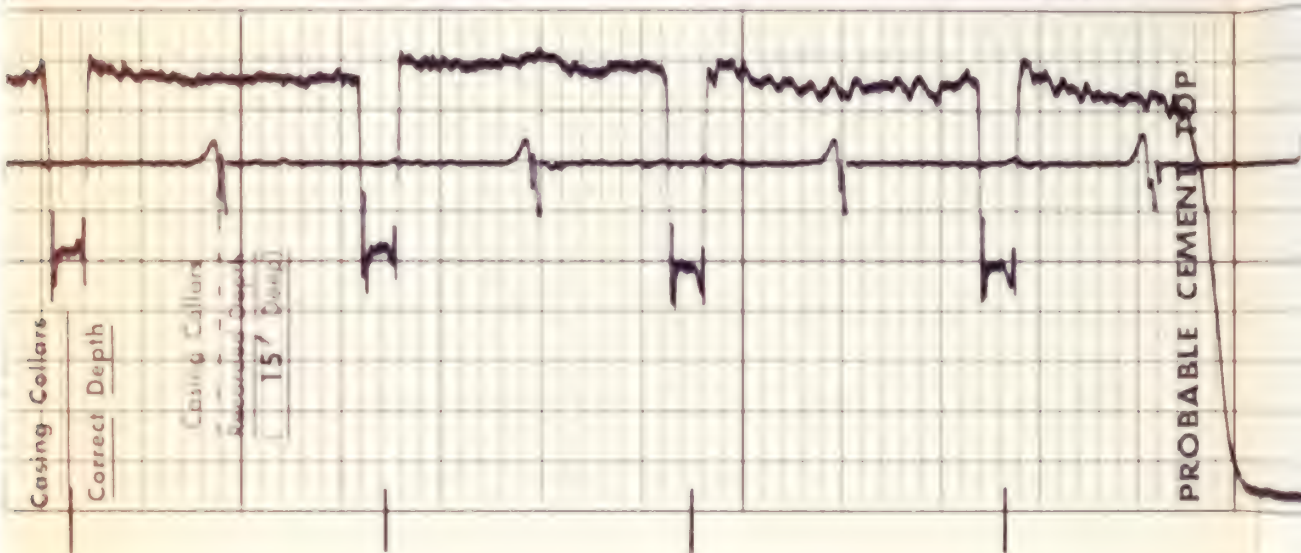
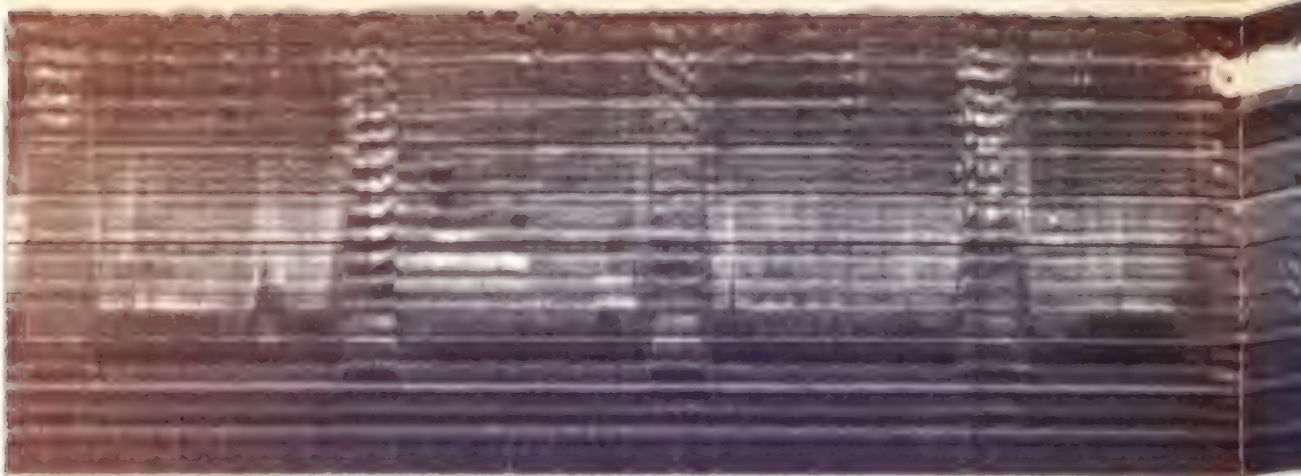
BOND LOG
MILLIVOLTS

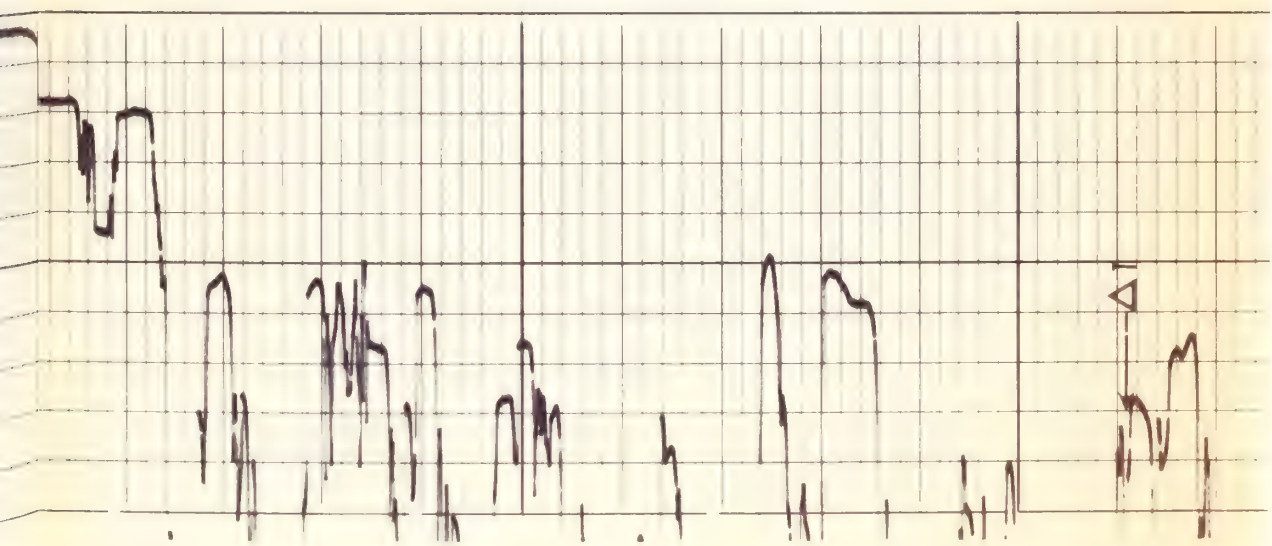
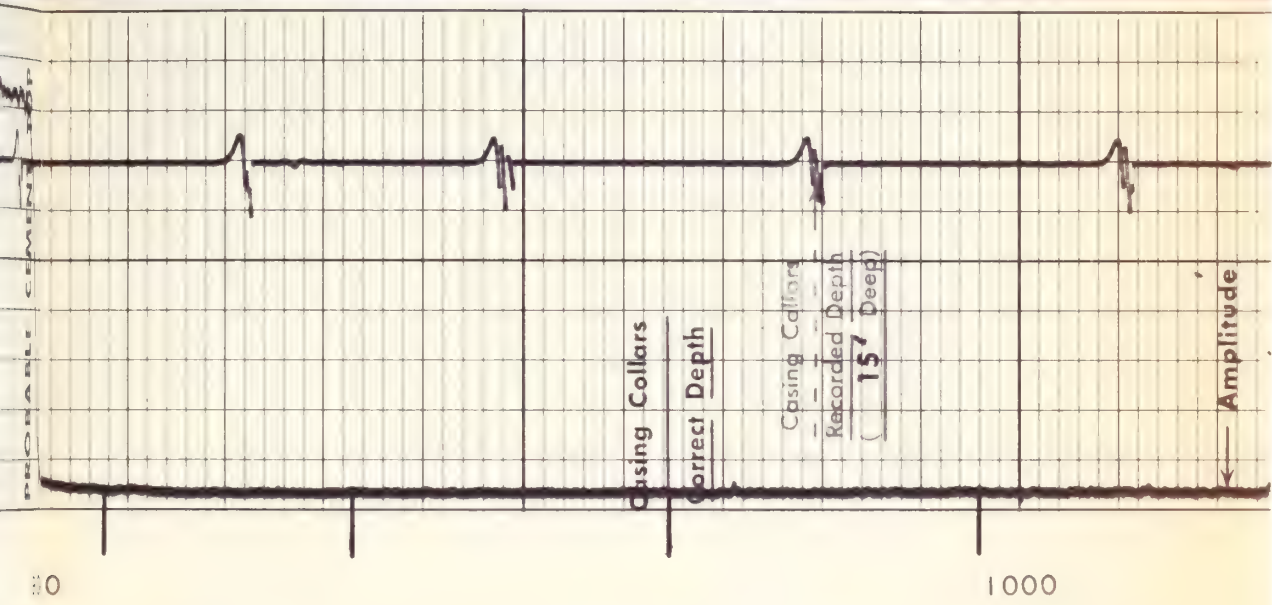
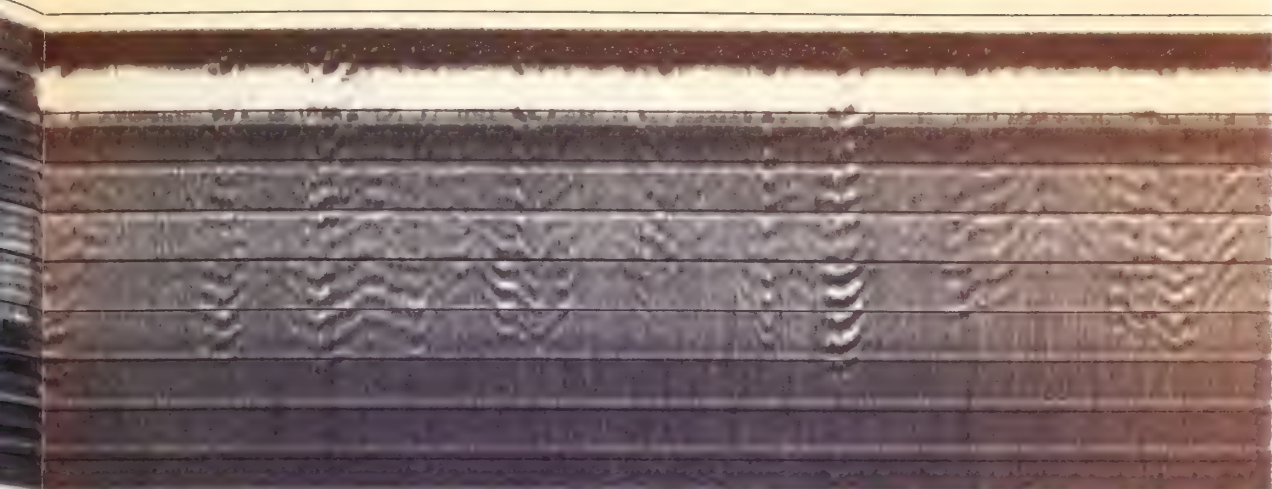
BONDING INCREASES
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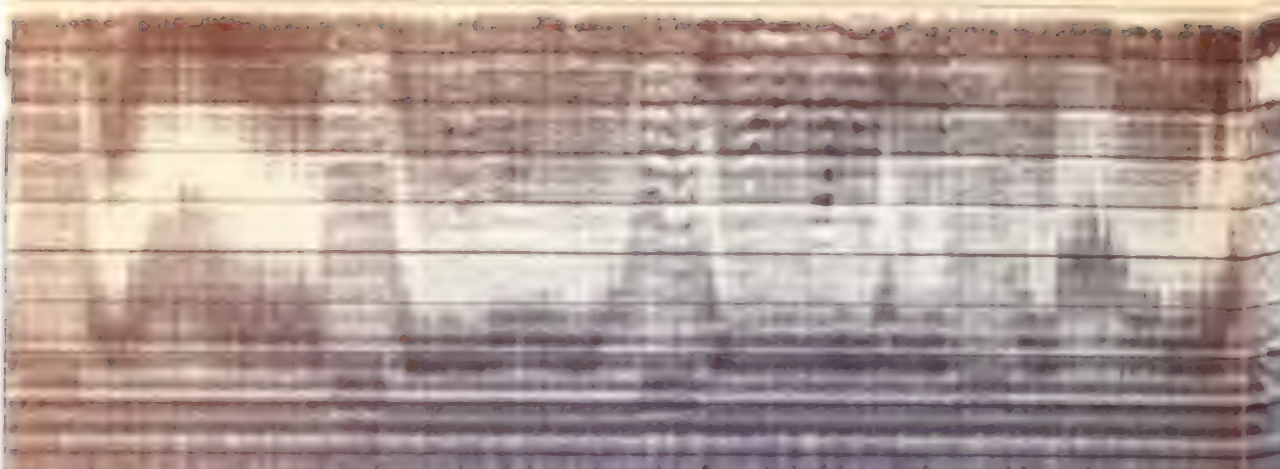
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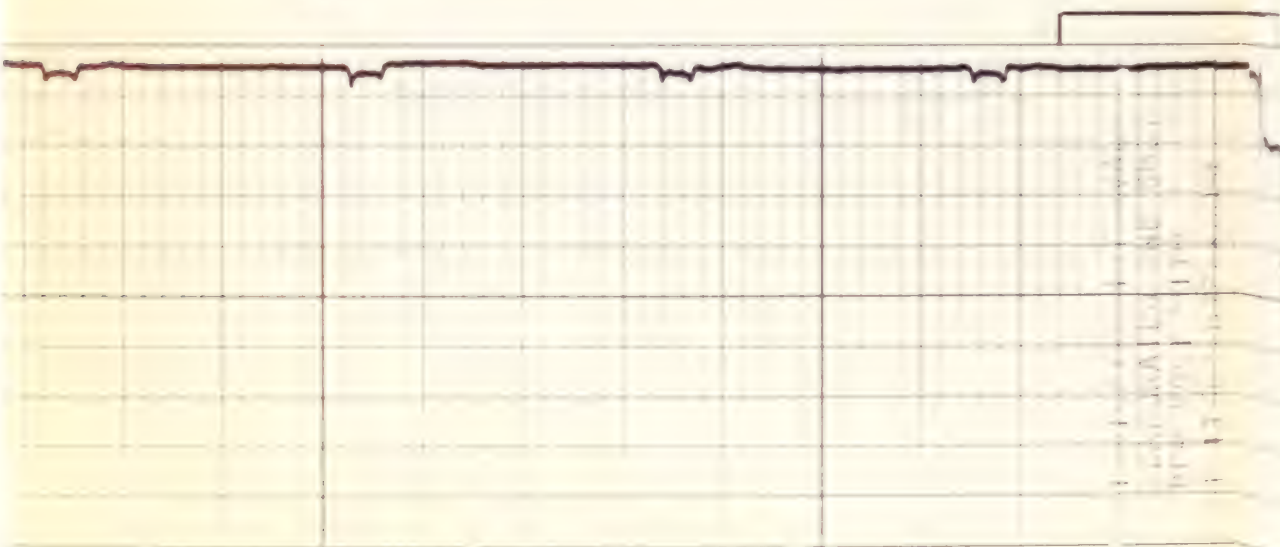


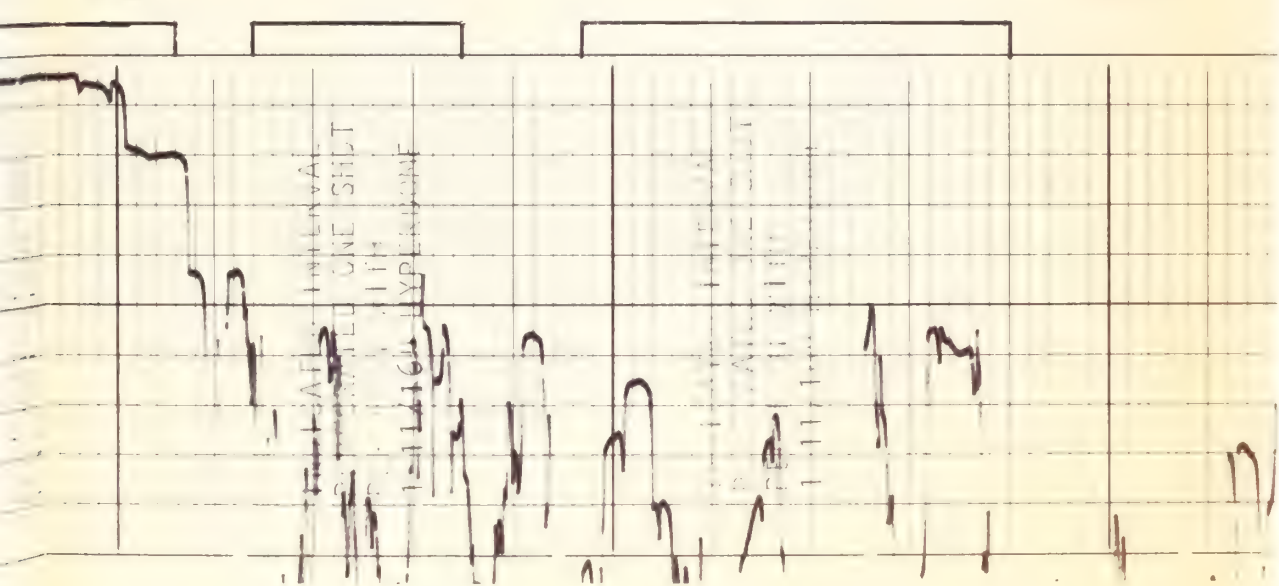
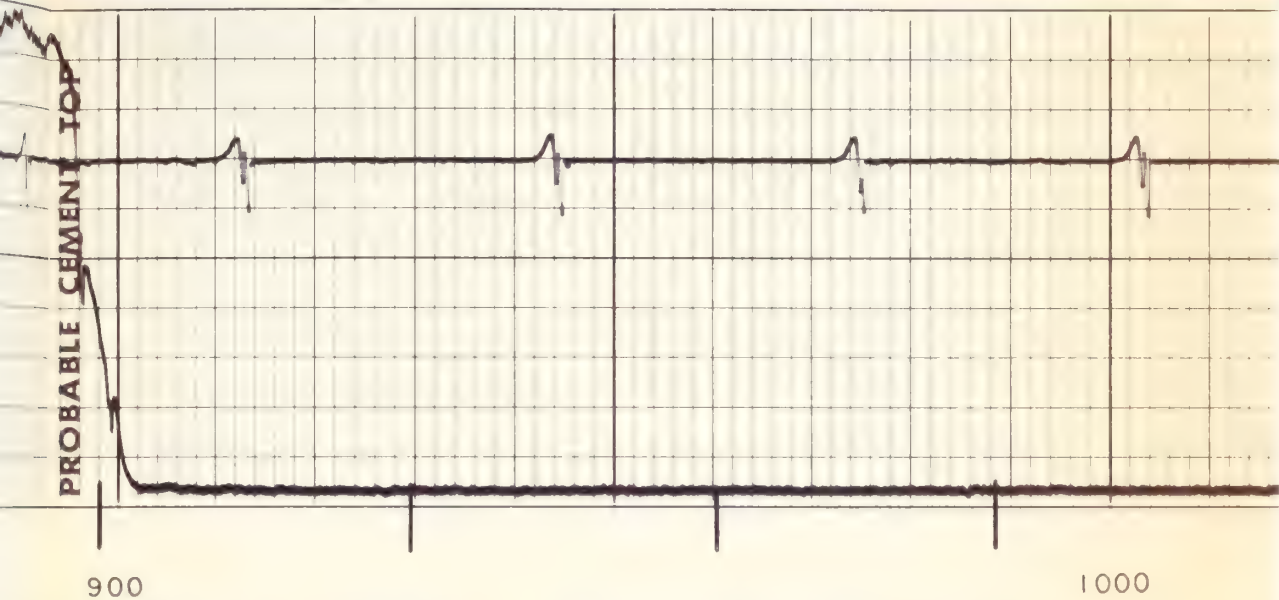


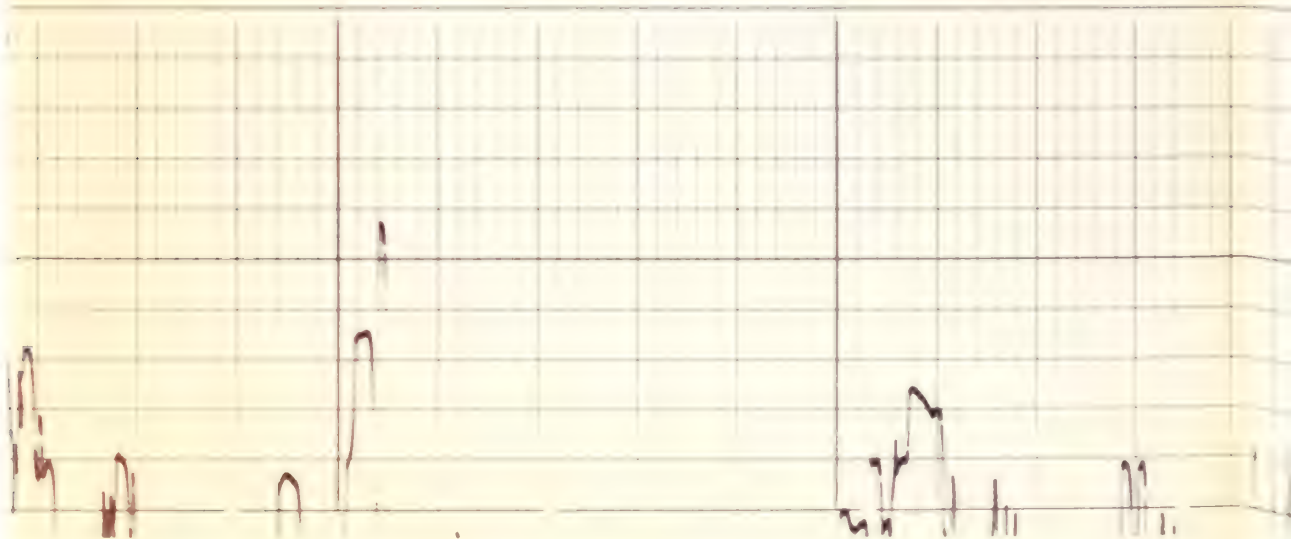
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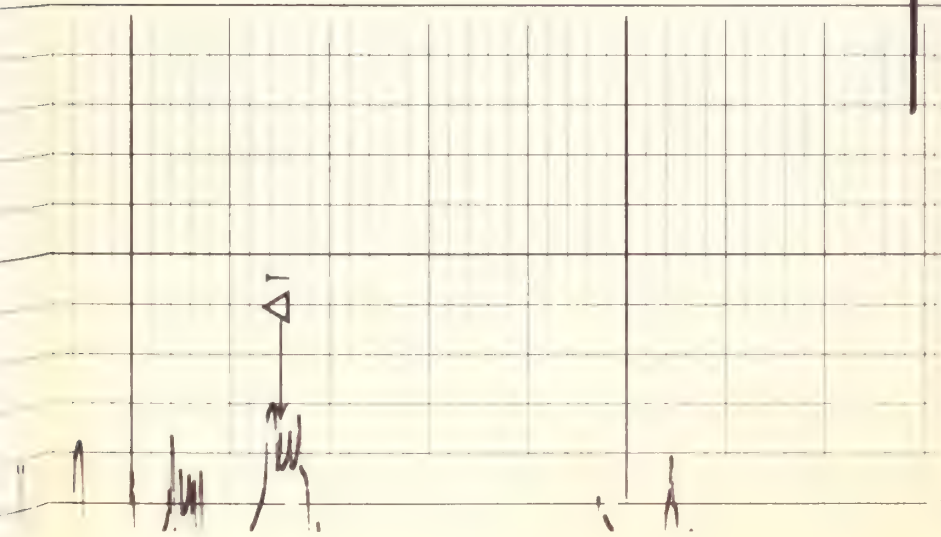


800





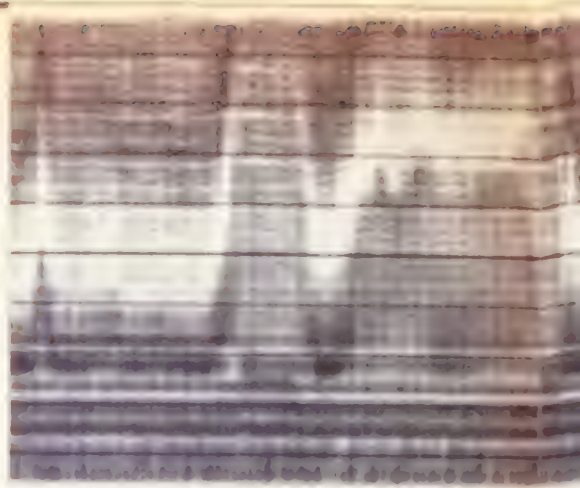
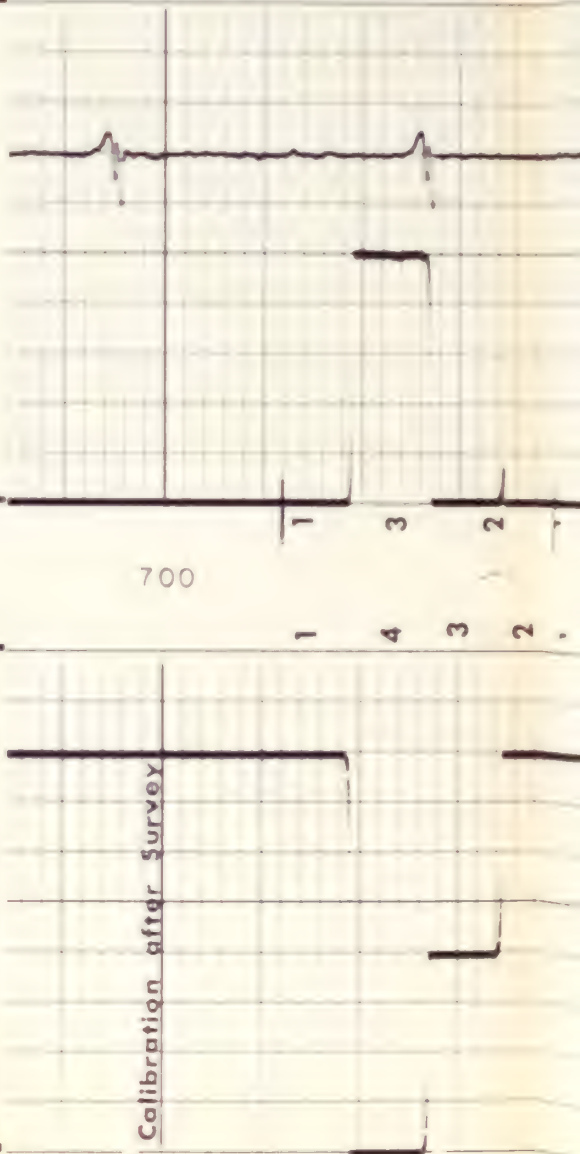


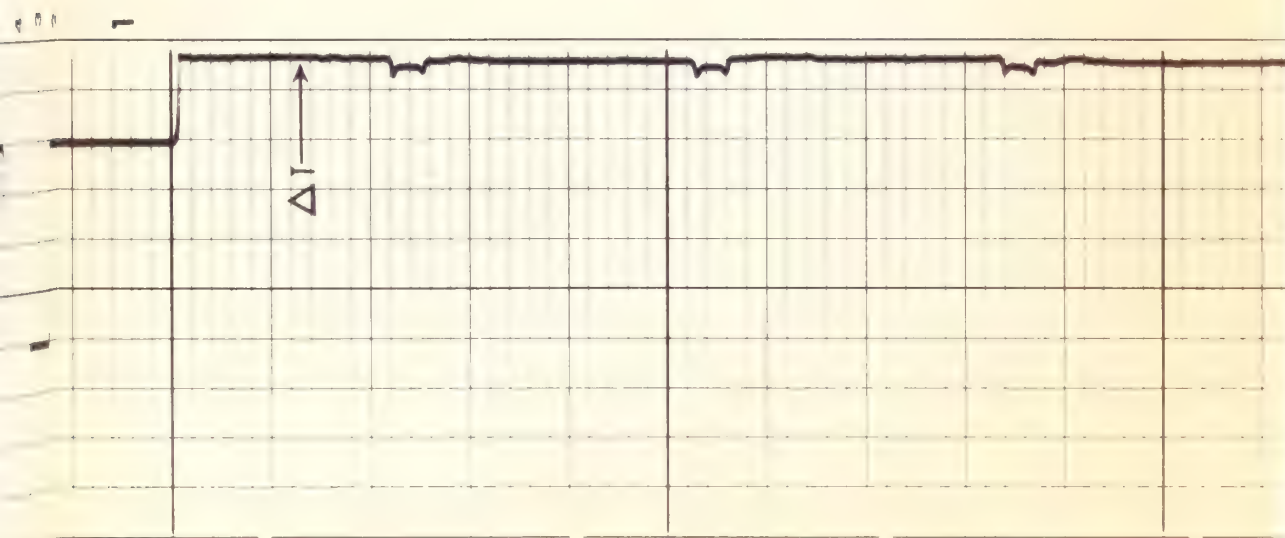
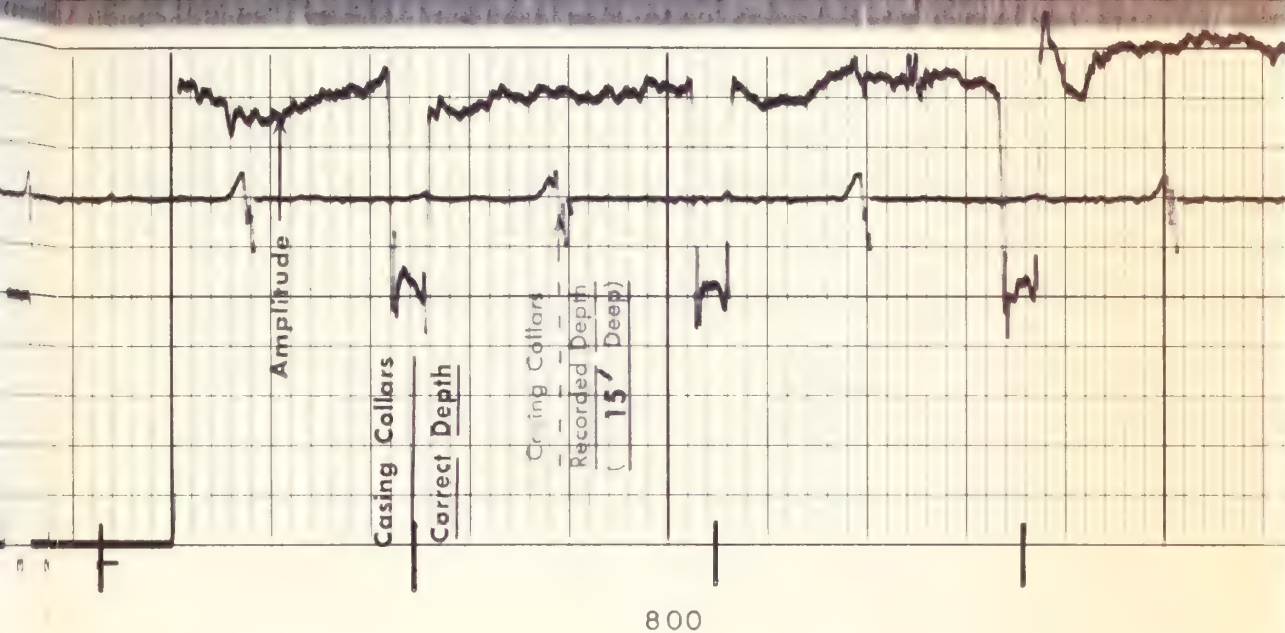


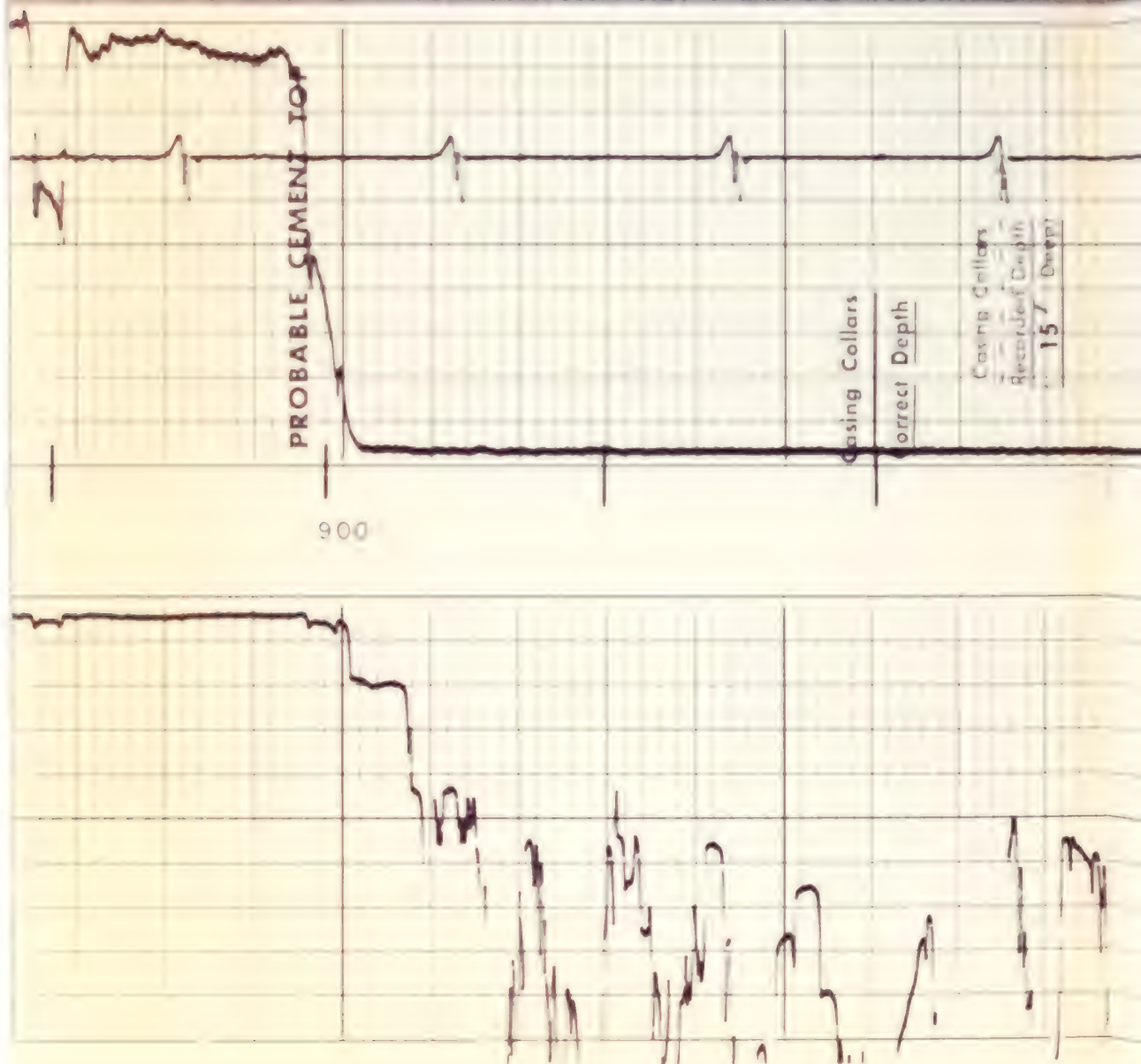
BONDING INCREASES
 0 50

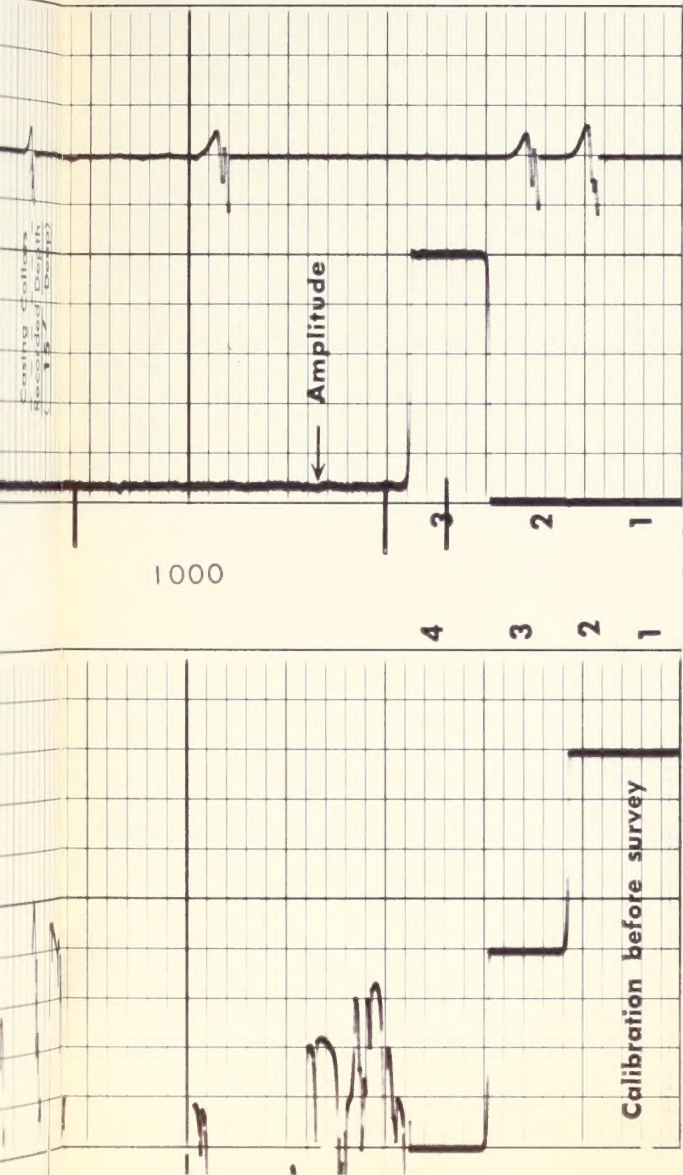
400 200

| TRANSIT TIME MICROSECONDS | DEPTHS | BOND LOG MILLIVOLTS | |
|----------------------------------|--------|--|----|
| <div>4000 3000 2000 1000 0</div> | | | |
| TRANSIT TIME MICROSECONDS | DEPTHS | BOND LOG MILLIVOLTS | |
| 400 | | 0 | 50 |
| 200 | | <div> <div>BONDING INCREASES</div> <div>↓</div> </div> | |
| | | | |









| TRANSIT TIME MICROSECONDS | | DEPTHS | BOND LOG MILLIVOLTS | |
|------------------------------|-----|--------|------------------------|------|
| 400 | 200 | | 0 | 50 |
| | | | 200 | 1200 |

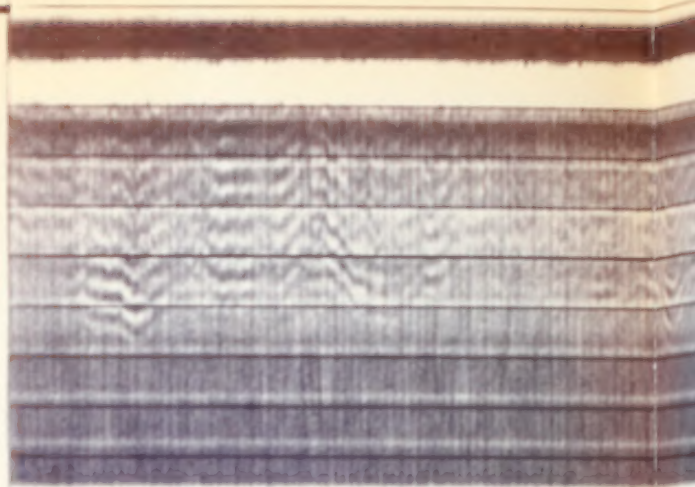
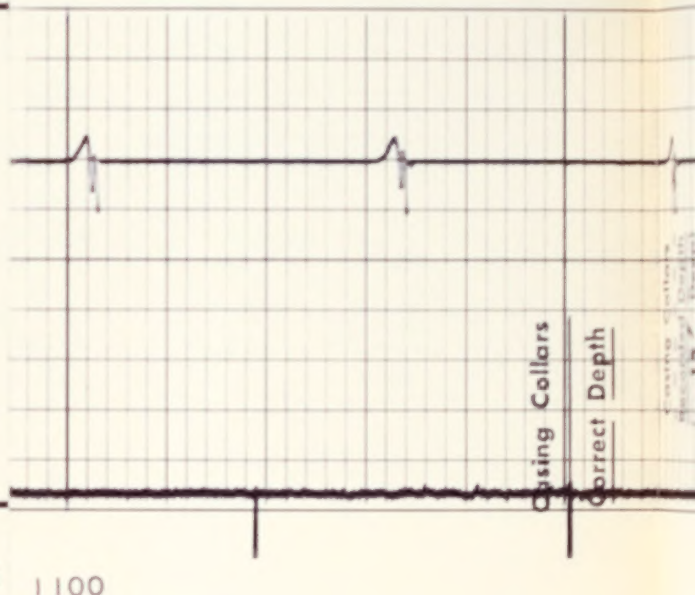
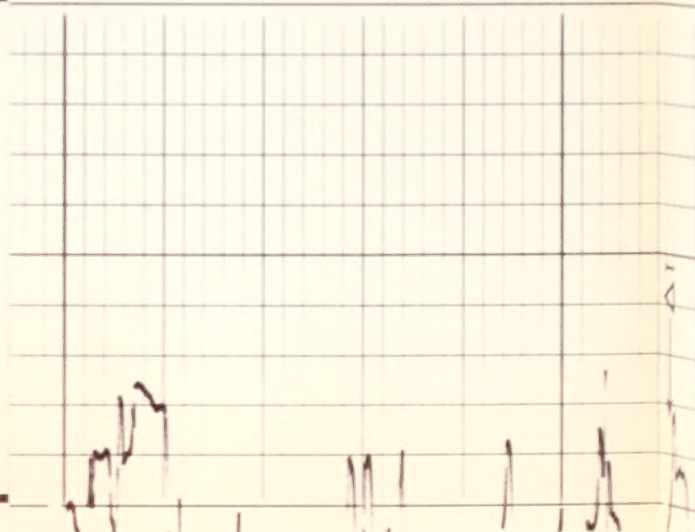
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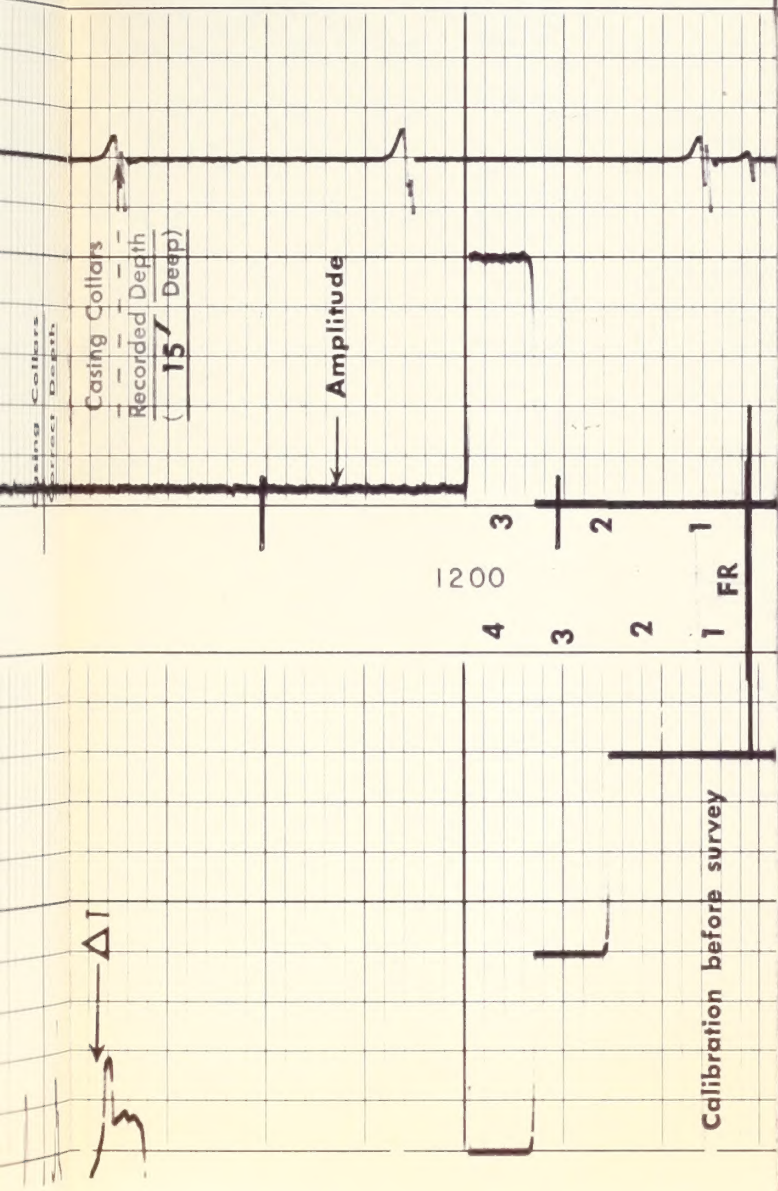
DEPTHS

BOND LOG
MILLIVOLTS

BONDING INCREASES

50





| | | | |
|---|--|--|--|
| TRANSIT TIME MICROSECONDS <u>200</u> SPACING <u>200</u> | | CASING BOND MILLIVOLTS 0 50 | VARIABLE DENSITY MICROSECONDS <u>5</u> FT. SPACING 200 1200 |
| DEPTH | | | |

COMPANY _____

WELL _____ S.G. NO. 1 _____

FIELD _____ SORGHUM GULCH _____

COUNTY _____ RIO BLANCO _____ STATE _____ COLORADO _____

SCHL. FR. 25011239
SCHL. TD. ---/1240
DRLR TD. 251071234
Elev: _____

KB. ---
DF. ---
GL. 6423

CEMENT BOND CALIBRATION CODING

| | Δt | AMPLITUDE |
|--------------------|------------|-----------------|
| 1. MECHANICAL ZERO | | MECHANICAL ZERO |
| 2. 240 μ sec | | ELECTRICAL ZERO |
| 3. 320 μ sec | | CALIBRATE |
| 4. 400 μ sec | | |